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Harvests Ice To Cool Acid Next Summer

Consolidated Water Power & Paper Co. Cuts Ice In Wisconsin River For Cooling Purposes In Hot Weather—Sees Expansion of Paper Industry—Assessments For Paper Mills—Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., February 5, 1945—Three thousand tons of Wisconsin river ice is being cut by the Consolidated Water Power and Paper Company at Wisconsin Rapids, Wis., to form a stockpile for use next summer to cool acid in its sulphite mill in that city. The company has kept a section of the river free of snow in order to get a clear sheet of ice.

The ice harvest is a precaution against a repetition of last summer's experience resulting from restrictions imposed by the city's water and light commission whereby industrial as well as domestic users were denied city water when an acute shortage developed.

Upon that occasion the Consolidated was forced to turn to the river as a source of water for cooling purposes, but the river temperatures were too high to create the desired cooling. A firm of custom sawyers and ice harvesters is packing the ice in sawdust and shavings on company property. This is the first time the company has resorted to ice for cooling on a large scale. The ice is clear, free from bubbles and cloudiness and averages 18 inches in thickness. The cakes are cut 22 by 44 inches, each weighing about 500 pounds.

W. F. Adrian Elected Treasurer

Walter F. Adrian was elected secretary-treasurer of the Badger Paper Mills, Inc., Peshtigo, Wis., at the annual directors' meeting on January 30. He succeeds J. W. D. Liginger, Milwaukee, Wis., who has retired. The number of directors was reduced from seven to six, J. B. Angle, also of Milwaukee, also having retired. Other officers were reelected: E. A. Meyer of Menominee, Mich., president; C. W. Hoeper, Menominee, executive vice president; and F. J. Lauerman, Marinette, Wis., assistant secretary-treasurer. J. P. Pulliam of Milwaukee is chairman of the board of directors.

Resigns as Personnel Director

Resignation of W. J. Melville as executive personnel director of Nekoosa-Edwards Paper Company, Port Edwards and Nekoosa, Wis., was announced February 1 by J. E. Alexander, company president and general manager. Mr. Melville has been with the company for two years, prior to which he was associated with the Employers Mutual Liability Insurance Company at Wausau, Wis.

Mr. Alexander announced that for the time being C. H. Reese will direct the personnel administration department. William R. Cahill has been transferred to the personnel department and his duties in the priorities division will be assumed by Edward Neuberger.

Sees Expansion of Paper Industry

Expanion of the paper industry and of affiliated industries during the post-war years was predicted Monday, January 29, by Arthur G. Wakeman, Kimberly-Clark Corporation, Neenah, Wis., in an address before the Neenah Club.

He said that new developments in book papers, food packaging papers and sanitary papers could be expected. The American people average 305 pounds of paper per person per year, as compared to .8 pounds per person in China, 23 in Japan, 80 in England, 12 in Russia, and 103 in Germany, he said, indicating that the more civilized countries show a great per capita consumption of paper and its allied products.

Mr. Wakeman told how English paper mill firms continued manufacture despite Nazi bombing raids, "watching the machines which were operating through slits in air raid shelters as bombs were dropping." Mr. Wakeman, who was in England during bombings, praised the English people for not compaining, not giving up, and cleaning up after bombings as fast as the Nazis bombed.

Foremen Attend Training Course

About 150 foremen are attending a training course at Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., in groups of about 15, each group meeting for two hours a day for a one-week period. There are two groups a day, four days a week, one meeting in the morning and the other in the afternoon.

The primary purpose of the course, conducted by Charles Pagnucco, Milwaukee, Wis., of the Wisconsin Vocational school department, is to prevent irritating problems and to adjust them as they occur.

Foremen in all parts of the mill have been asked to bring in problems. These are broken down into facts and causes which may have contributed to the problem. The men investigate these causes and list them in order of their importance, enumerating possible remedies and rating these also in the order of their importance. The final step is to construct a plan to put the remedy into effect.

Proposes Assessments on Water Users

The Wisconsin Valley Improvement Company,

(Continued on page 18)

Chicago Discusses Possible Price Rise

WPB Efforts To Increase Paper Output In Cooperation With OPA To Adjust Manufacturers Prices At Higher Level Creates Interest In Midwest — Salesmen Hear Sports Talk — Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., February 5, 1945—The efforts of the War Production Board and Office of Price Administration to speed up production of critically needed merchandise by increasing the manufacturers' price has caused speculation here as to whether or not paper—"certainly critically needed"—may not get this same attention. It is reported that the OPA and WPB expect to get this production by advancing prices wherever it can be shown that such increases are necessary to cover increased costs of operation. In other words, according to local paper trade heads, "OPA has gone a long way in recognizing the fact that it was erroneous to insist that 1941 and 1942 be the base price years. A lot of things have happened to our costs since that far off date. Now they may be beginning to get realistic."

Meanwhile, local conditions show no improvement. Civilian demand slackened off somewhat with the shortage of merchandise in various fields but consumer demand for goods is at an unprecedented high. Campaigns to encourage salvage have been of only fair effect and the industry is rapidly going beyond that "one year until normalcy" estimate it formerly made. Bonds and ledgers jumped into the top of the "demand" record this week. Krafts and all wrapping papers were increasingly tight. All "military papers" suffered, too, from the wide expansion of military activities in all parts of the globe. Waste paper collections were better but in professional quarters manpower shortages and collection costs still were reported as an appreciable "brake."

Salesmen Hear Sports Philosophy

Football filled the air lanes at the regular Monday noon meeting of the Salesmen's Association of the Paper Industry held on January 29 at the Hotel Sherman. But with the athletic side came a genuine and sincere appraisal of the importance of athletics in war time as given by one who certainly knows the score—Luke Johnsos, sales executive of the Zellerbach Paper Company. Luke, as an important sideline, is co-coach of the Chicago Bears professional football team. He thrilled the good sized crowd with his philosophy, after an excellent introduction by division vice president Pat Patterson of the Flambeau Paper Company.

Mr. Johnsos maintained that pro athletics were of great interest to the men in the services, provided a good attraction for war workers, taught physical fitness and, all in all, were worthy of continuance through participation of every athlete who was not qualified to be in the armed forces. "However," added Johnsos, "if professional athletics is considered as lengthening the war one minute or retarding its successful prosecution we'll stop it in a second." He indicated that only 1700 men were involved in professional baseball, football, hockey and other pro sports which, to the audience at least, didn't seem to be enough to get unduly excited about as long as their draft boards had given them a deferrable status.

Mr. Johnsos then ran off several motion picture films including some excellent action shots of Green Bay Packer-Chicago Bear games. Johnsos explained that "we always show only the films of games the Bears win!" The appreciative audience expressed its thanks to Sterling Brown of the Champion Paper & Fibre Company for inducing Luke Johnsos to do the swell job he did.

Meanwhile, the association is preparing for their annual session on February 5 at which time nominations for officers will be made; committee reports will be filed and other business reported on to permit President Burt Fisher and Vice president Patterson to express the wishes of the western group at the annual luncheon of the Association to be held in New York City on February 19. At this time, only these two sales executives are scheduled to make the trip—a real sign of the limitations of travels and war conditions.

War Veterans Plea for Paper

Chicago's public and parochial school children have a treat in store for them next week when 25 war veterans returned from over seas will give pupils first hand information on the importance of waste paper collection in the war program. The veterans will be accompanied by representatives of the paper industry who have taken a leading interest in the paper salvage program. The program is a part of a campaign designed by the War Production Board to spur regular collections and to set the stage for monthly high school collections the first of which is set for February 16. The high school goal for that day is 1½ million pounds. Public high schools have collected five million pounds in the last year and the total for elementary schools is 36 million pounds in this same period. Prizes will be awarded to the twenty-five leading schools at the end of the campaign and Mayor Edward J. Kelly will give a dinner in the Morrison Hotel on February 23 for the leading boy and girl collector from each of the 25 schools. Parents will also be invited.

It was reported that despite the fact that collections in Chicago were exceptionally good compared to the rest of the country, paper mills consuming the salvage waste paper were still not loaded with sufficient supplies.

Buys U. S. Pipe & Foundry Interest

The Duraloy Company, Scottdale, Pa., announces the purchase from the United States Pipe and Foundry Company, Burlington, N. J., of its interest in the Buraloy Company. The new board of directors of the Duraloy Company is as follows: T. R. Heyward, Jr., W. F. Furman, H. T. Harrison, W. L. King, F. S. Wynans.

Officers of the company are: T. R. Heyward, Jr., president; W. F. Furman, vice president in charge of operations; H. T. Harrison, vice president in charge of sales; F. S. Wynans, secretary-treasurer; J. J. Baum, plant superintendent.

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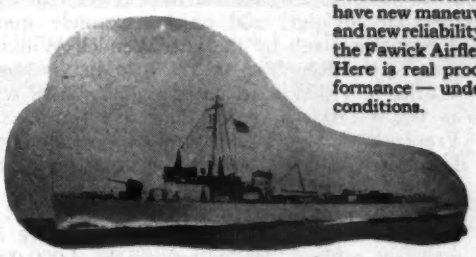

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Warns of Foreign Competition in Paper

Pulp and Paper Men Generally Disposed To Seriously Consider Possibility That Scandinavian Countries May Prove Strong Competitors After War — Explains Position of Russia — Other News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., February 5, 1945—Among the hundreds of pulp and paper men in Montreal for the recent annual meeting of the Canadian Pulp and Paper Association there was a general disposition to take quite seriously the warning of Vance P. Edwardes of the likelihood of serious competition from the Scandinavian countries after the war. Mr. Edwardes, who is president of the Technical Association of the Pulp and Paper Industry, gave his warning at the annual meeting of the New York-Canadian Division of the American Pulp and Paper Mill Superintendents' Association, when he said:

"Without going into detail, it can be assumed that competition between the individual mills on this continent and those in the European countries will be very keen. Aside from any question of price, quality is going to be the criterion by which our products will be judged, and the organization producing the best quality product will get the business."

Those here who are personally acquainted with mills in the Scandinavian countries bear testimony to the high technical standards attained and the excellence of many of their products. They are also of the opinion that it would be well to discount much of the stories about the dislocation of the industry and the destruction of forest resources in the European countries while under German occupation. They regard it as possible that for a time the needs of Great Britain and of the European countries will absorb the major portion of the Scandinavian output, but they point out that in Sweden the only effect of the war on the industry has been to cut off its export markets. While it is true that there has been a great drain on the forests for purposes other than the products of pulp and paper, trade papers from Sweden report that the operators are anxiously awaiting the resumption of overseas shipments, and that as regards pulp, the mills have very large stocks ready for immediate shipment after the war, all available storage capacity being used up. Inquiries for supplies, it is stated, have already been received from most of the former markets, and already arrangements have been made with buyers in Great Britain for the sale of 250,000 to 300,000 tons (dry basis) of wet mechanical pulp. Shipments are to commence immediately on the resumption of navigation.

The Position of Russia

Robson Black, president of the Canadian Forestry Association, has revealed that in a cable from the Soviet forestry authorities the following statement in regard to the destruction of Russian forests by the Germans has been made: "The forests on territory temporarily occupied by German invaders have suffered considerable damage. In many places the Germans carried out planned destruction of forests as they retreated and tree nurseries were destroyed wherever the Germans set foot. In some places all that was left of large forests were charred stumps and a few uprooted trees." In releasing the cable, Mr. Black referred to the rapid developments in Russian forestry during the war years, and said the Russians had cut their record of forest fire damage since 1940 by 50 per cent.

This information has renewed interest in the question as to what extent Russia will become a competitor of the industry on this continent after the war. One man prominent in the industry who was questioned on the subject said Russia was a serious potential competitor. He pointed out that the vast bulk of the forest resources of Russia were never reached by the German invader, and as an example quoted the description given by the late Wendell Willkie of his visit to the Republic of Yakutsk, in his book "One World." Mr. Willkie stated that Yakutsk was twice as big as Alaska, more than five times as big as France, and bigger than any other Republic in the U.S.S.R. After describing the immense forest areas in this Republic over which he flew, Mr. Willkie quoted its president, a man named Muratov, who he said was a well educated and very active business man, as saying "We'll cut nearly 4,000,000 cubic meters of wood this year, against 35,000 in 1911. And we've still got a long way to go before we hit the annual growth, which we figure is 88,000,000 cubic meters." Mr. Willkie said Muratov obviously had been planning in terms of international trade, for he pointedly added: "When this war is over, you in America are going to need wood and wood pulp. And we're going to need machines. We're not so far away from you, as soon as we get the Arctic sea route open. Come and get it; we'll be glad to swap."

Harold Crabtree Commended

For his work in war industry, Harold Crabtree, president of the Howard Smith Paper Mills, Ltd., and past president of the Canadian Pulp and Paper Association, has been highly commended by G. K. Shiels, C.M.G., Deputy Minister of Munitions and Supply. In a message to the Association, Mr. Shiels says: "There is a very direct connection between the success of our great chemicals and explosives production program and the fact that Mr. Crabtree is president of Allied War Supplies Corporation, the Crown company administering this program. Since the inception of this undertaking five years ago, he has devoted himself solely to the service of the nation. To him personally goes much of the credit for the success of our explosives and ammunition output, which is being used not only by Canada, but by Britain, the United States, Russia, and China."

Forestry Unit in Action

A cable from Field Marshal Montgomery's Headquarters on the western front announces that Canadian lumbermen, felling timber deep in the Ardennes, swopped axes for guns when Field Marshal von Rundstedt launched his great offensive. Four companies of the Canadian Forestry Corps were putting away their axes for the night when the warning came that the German attack was expected. Major Roxby, M.C., of Kelowna, B. C., the area sub-commander, doubled the guards, threw out pickets and sent patrols

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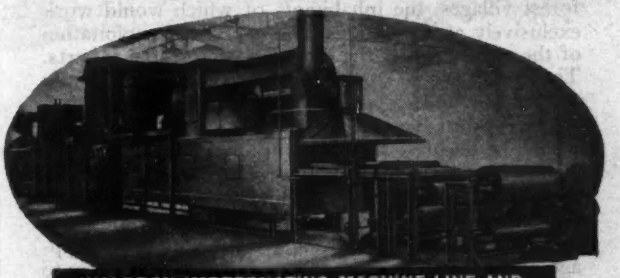

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to nearby bridges and villages. Later came news that the Germans had broken through, and the forestry companies moved back across the Meuse. A few hours later orders came for them to return to their original positions. They were just bedding down at 11 o'clock at night, when an American tank roared into the camp, reporting that the tail end of the column in which it was travelling had been shot up. Within 20 minutes a forestry convoy was rolling with the Americans towards St. Hubert, where the men were organized into parties for patrol and defense duties. A thick fog blanketed the area for days, through which fog the Canadians exchanged shots with the Germans. The men, on guard for long hours, took turns in snatching some sleep in a bicycle factory. At the request of the Americans, they stayed to strengthen the slender garrison until the Germans fell back.

Permanent President of C.P.P.A.

Rather more than a year ago it was decided that a full-time salaried president, on a permanent basis, should be appointed head of the Canadian Pulp and Paper Association. Due to the exigencies of the war, it has not yet been found possible to make the appointment. However, E. Howard Smith, the retiring chairman of the Association's Executive, in stating that the work of the Association has been hampered by the lack of a full-time president, says the Executive has been devoting considerable thought to the matter of late, and he expects that a definite announcement may be made in the near future.

Form Forestry Engineers Section

A Quebec Section of the Canadian Society of Forest Engineers has been organized, with F. T. Jenkins, of Montreal, as chairman. A number of standing committees has been named to operate throughout 1945 to arrange programs and meetings. Heretofore Quebec was the only province in the Dominion not represented by a Section of this Canadian-wide Society.

Forest Villages Recommended

The Quebec Forestry Association has recommended the establishment in the province of Quebec of small forest villages, the inhabitants of which would work exclusively at the national and controlled exploitation of the woods, under the direction of forestry experts. The project would cost an estimated $2,000 per family to establish, and 75 per cent of this cost would be paid in the form of long-terms rentals. A reasonable wage would be assured to each worker, and each family would be provided with low-rental houses. A long-term loan system is proposed under which both capital and interest would be repaid at the time of the reaping of the timber crop through the medium of stumpage dues. This is viewed as possibly the best system to bring about the reforestation of private lands unsuitable for agriculture.

Will Supply 30-Pound Newsprint

Charles Vining, president of the Newsprint Association of Canada, has reiterated to the American Newspaper Publishers' Association the readiness of Canadian newsprint manufacturers to supply 30-pound newsprint if that is considered desirable, and it is understood that conferences on the matter will be held shortly, although there seems little likelihood that previous objections to this weight newsprint will be over-ruled.

Plans for Port Alberni Pulp Mill

Plans for the establishment of a new sulphate pulp mill at Port Alberni have advanced a further stage. Bloedel, Stewart & Welch Limited, one of the major timber concerns of British Columbia, were planning the erection of such a mill alongside their large sawmill at Port Alberni, B. C. at the outbreak of war. Since that time, while no major move towards building of the mill was proceeded with, plans were quietly completed. It is now announced that contingent on the approval by the Provincial Government of an assessment agreement between the City Council of Port Alberni and the company that the company will erect a plant there with an annual production of 50,000 tons of sulphate pulp.

Following several meetings between Bloedel, Stewart & Welch officials and the Port Alberni City Council recently, agreement was reached on a 20-year fixed assessment proposal which will be laid before Hon. Herbert Anscomb, Minister of Municipal Affairs and his deputy, E. H. Bridgman.

Work on the new pulp mill, which is intended to begin at the earliest moment, must be withheld until the terms of the agreement are ratified by the municipal department and enabling legislation passed by the Legislature.

Prentice Bloedel, president, and Bruce M. Farris, vice-president of Bloedel, Stewart & Welch, Ltd., in company with Gordon Campbell, city solicitor for Port Alberni, recently interviewed Mr. Anscomb regarding this matter.

Company plans call for the erection of a most modern type of plant to utilize present mill and logging waste. A complete recovery plant is included in the plans and the chemicals used the process will be reclaimed and used again.

It will take approximately three years to construct and put the pulp mill into actual operation, employing during this period a number of men on the construction and installation of machinery, but on completion and when in operation the mill will employ some 200 workers.

To secure the passage of enabling legislation for the assessment agreement, a petition to obtain the necessary three-fifths or more of the number of registered voters in Port Alberni is being prepared. No difficulty is anticipated by the City Council or the Port Alberni Board of Trade, which has backed the project, in securing the required number of names.

Appointed By United Wallpaper

William R. Hall, management engineer and acting controller for three months, has been appointed Controller of United Wallpaper, Inc., and its subsidiary, the Trimz Company, Inc., president William H. Yates has announced.

Mr. Hall, a commerce graduate of Ohio State University, comes to the wallpaper concern from the Wolf Management Engineering Company, for which he had served as management engineer for two years. Prior to coming to Chicago for the Wolf organization, he had served as secretary and controller of the Firestone Tire & Rubber Company's rubber plantation in Liberia. He had also engaged in public accounting work in Cleveland for several years following his graduation from Ohio State.

Mr. Hall lives at 7606 South Shore drive, Chicago, is married but has no children. He is a native of Ohio.

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Mathieson, leading producer of chemicals for water purification for nearly 50 years, invites water officials troubled with taste and odor problems to investigate the new Chlorine Dioxide technique for possible post-war use.
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Obituary

Rennie McCracken

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., February 5, 1945—Major Merrick Rennie McCracken, M.C. with two bars, M.M., of Montreal, has died suddenly in his 54th year. A veteran of the Great War and this war, Major McCracken, who rose from the ranks, had been in failing health since he was invalided from the Canadian Forestry Corps in April, 1943, but had been able to resume his civilian occupation.

Born at Danville, Que., he served in the first World War from 1914 to the end, being awarded the Military Cross and subsequently two bars to it for his outstanding services.

Returning to Canada in April, 1919, Major McCracken entered the employ of Price Bros. & Co. Ltd. and engaged in logging operations at Rimouski and Chicoutimi, later going to Murray Bay to work for Donohue Brothers, Limited.

When the present war began Major McCracken enlisted in the Forestry Corps and commanded a company which he later took to Scotland in 1941. In April, 1943, he returned to Canada invalided from the service and resumed his former employment.

Surviving are his wife, the former Julia Donohue, of Montreal whom he married in 1925; three sons, Angus, 18, now on active service at Aldershot, N. S.; Stewart, 16, and Donald, 8; and one brother Arthur McCracken, of Port Arthur, Ont.

W. M. Gardella

Oliver United Filters Inc. announces with deep regret the death of one of its oldest and most valued employees, William Mitchell Gardella, at Springfield, Ohio on January 26, 1945. Mr. Gardella joined the company in 1916 and served for many years as Sales Development Engineer. In the course of his duties he travelled all over the world installing and starting up Oliver United Filter installations and studying filter operations in many different countries. Much of the company's success can be attributed to his keen analysis of filtration and clarification problems and to his knowledge of filter construction.

Widely known throughout industry as "Bill" Gardella he leaves countless friends. He is survived by his wife, a daughter, Gladys, and a son William Bert Gardella, who is with the company in a sales engineering capacity.

E. F. Lunken

Eshelby F. Lunken, President of The Lunkenheimer Company, Cincinnati, Ohio, valve manufacturers, died suddenly January 25, 1945, of a heart attack. He was 54 years of age.

At the time he was stricken, Mr. Lunken was making preparations to attend the annual dinner of the National Association of Manufacturers as a guest of honor, The Lunkenheimer Company having been one of the Cincinnati firms which founded the NAM.

He was a leader in business and civic affairs and was actively interested in aeronautical development, having been a moving spirit in the establishment of Lunken Airport. He also worked closely with the Committee for Economic Development, of which he was a member.

Mr. Lunken was a son of Edmund H. Lunken, who at the time of his death in July, 1944, was Chairman of the Board. He was connected with The Lunkenheimer Company for 35 years and served as President 26 years. He was a grandson of Frederick Lunkenheimer, founder of the Company.

Fleming & Sons Deny Charges

WASHINGTON, D. C., February 7, 1945—Fleming & Sons, Inc., and Albert Couchman, trading as Couchman Advertising Agency, both of Dallas, Texas, have filed answer to a Federal Trade Commission complaint which charged them with having cooperated in the use of radio, periodical and circular advertisements in which they misrepresented the insulating properties of a building paper designated "Wallrite." Fleming & Sons, Inc., sells and distributes the paper, the advertisements for which are prepared and placed by Couchman.

In reply to the allegations of the complaint, the respondents admit having represented that the use of Wallrite in houses affords an insulation against heat and cold, will seal out wind and dust and give protection against dampness, cold, and summer heat, but deny they represent that the building paper is a nonconductor of heat and cold or is impervious to moisture or water. They also deny that any of the representations concerning their product are false or misleading.

The respondents assert that building or sheathing paper has always been manufactured, sold and used as an insulating material, not because it is an efficient nonconductor of heat but because of its efficiency in overcoming wind seepage and inhibiting the flow of hot, cold, damp or dust-laden winds. The answer alleges that so far as the respondents know Wallrite is purchased exclusively for use in houses of flimsy construction to prevent wind seepage, and that when so used it effectively seals the walls and ceilings against wind leaks, and by preventing the entry of outside air substantially insulates and protects the interior from the cold, heat, dust and moisture borne by such air. The respondents assert further that no purchaser has ever claimed that he was deceived or that their product was not as advertised.

Hearings will be held in due course.

Expands Use of Protective Papers

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., February 7, 1945—Retrictions covering the use of glassine, greaseproof and vegetable parchment papers have been simplified and clarified by the issuance of an amendment to the Specialty Paper Conservation Order M-286, War Production Board said today.

Glassine paper may now be used as a substitute for Holland cloth in the backing of retreading stocks for tires, tire reliners, patches and sandblast stencils, and as a wrapping on friction and rubber tape. Previously only vegetable parchment could be used as a substitute for Holland cloth in the manufacture of rubber products, officials of the WPB Paper Division said.

Glassine, greaseproof and vegetable parchment papers may now be used for wrapping tobacco and tobacco products packaged in folded flap type pouches as differentiated from the familiar paper package.

These types of specialty papers may not be used for wrapping or packaging popped corn, previously designated as popcorn, if used in laminated or duplex form containing more than 45 pounds of fiber per ream, it was pointed out.

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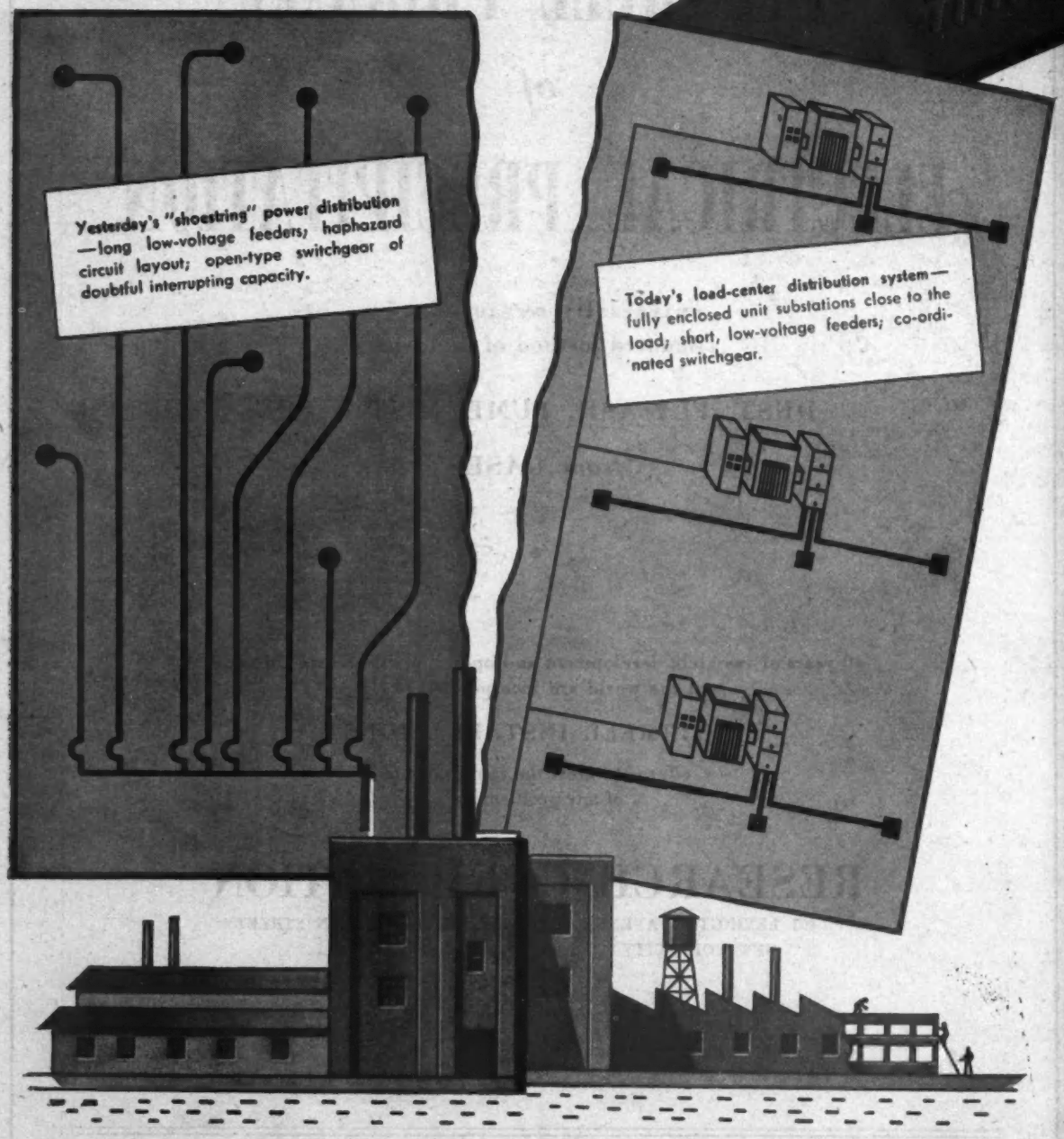
*Expanding your capacity?

*Installing new generators?


Yesterday's "shoestring" power distribution—long low-voltage feeders; haphazard circuit layout; open-type switchgear of doubtful interrupting capacity.
Today's load-center distribution system—fully enclosed unit substations close to the load; short, low-voltage feeders; co-ordinated switchgear.

* Paper mills equipped to generate power at 2300 volts or higher—or now installing new, higher-voltage generating capacity—can distribute power at generator voltage to unit substations, and there step down to utilization voltage. In expansions of present plants, a start can be made toward a load-center power system by using generators of 2300 volts and installing unit substations to handle new loads as a part of a step-by-step plan.

to Break With The Past!

IN PAPER-MILL POWER DISTRIBUTION

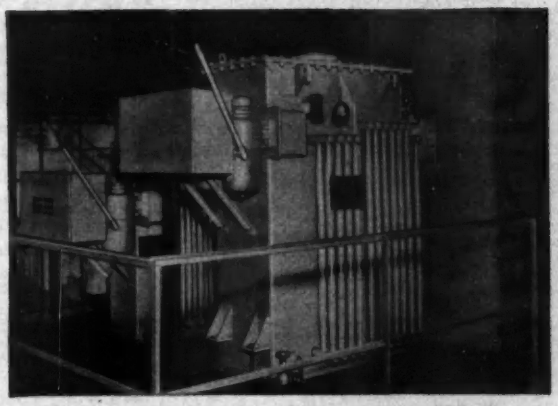
TODAY a great many prewar (and we mean *this* war) electric power distribution systems are outdated if not actually obsolete. Extending them or expanding them along the old lines simply enlarges your postwar obsolescence problem. In the meantime, they may limit the capacity of your new paper-making facilities, and impair your operating continuity.

Actually, war-plant experience proves that the fastest and most economical course is to *break with the past*, and install a LOAD-CENTER SYSTEM to distribute power to plant extensions.

Indeed, you may find that a *complete installation* of this modern power distribution system, throughout every section of your plant, is the only real solution of problems of operating continuity and excessive maintenance. If new generating capacity is being installed as a part of your expansion project, for example, the interrupting capacity of *every* old circuit breaker or protective device that you have may now be inadequate.

- *G-E load-center power distribution* has the flexibility to meet the needs of old plants, new plants, or any combination of the two. Many circuit arrangements and many hundreds of equipment combinations are possible, all based on a relatively few repetitively built basic elements.
- *G-E unit substations* can be installed anywhere in the plant, eliminating slowdowns caused by voltage drop in long, overloaded feeders.
- *G-E metal-clad switchgear*, co-ordinated in unit substations and elsewhere as required in the system, has the right interrupting capacity. This gives greater assurance of operating continuity, and greater protection to equipment and personnel.

The installed cost of a G-E load-center power distribution system is generally lower than that of piecemeal extensions of old systems. Its maintenance expense is certain to be less. For the complete story, ask your G-E representative. *General Electric Company, Schenectady 5, N. Y.*



This load-center unit substation, with a noninflammable Pyranol transformer, is on a balcony close to the load. Compact, self-contained, it occupies no useful floor space.

(Below) Modern G-E metal-clad switchgear, including control for 3000-kva, 2400-volt turbine-generator and primary feeders —the starting point for efficient paper-mill power distribution.

GENERAL ELECTRIC

202-30-890

Every week 192,000 G-E employees purchase more than a million dollars' worth of War Bonds.

Paper Production for December

The following data cover all known mills and represent a continuation of the monthly statistics initiated in "Facts for Industry," series 24-2-1. For annual data and a description of the statistics, "Facts for Industry," series 24-1-2 should be consulted. All inquiries concerning these data should be addressed to the Bureau of Census, Washington 25, D. C.

Type of paper	1944 December	1944 November[1]	December 1943
All types	1,328,489	1,464,762	1,361,485[2]
Newsprint	61,146	62,758	65,962
Groundwood papers	48,419	51,390	49,817
Printing	19,115	17,770	17,712
Specialties	29,304	33,620	32,105
Book papers	113,086	120,883	125,236
General printing	84,120	89,201	91,058[3]
Converting papers	28,847	31,629	33,929
Other book papers	119	53	249
Fine papers	80,890	85,970	78,493
Writing papers	61,019	64,323	57,214[3]
Cover and text	3,970	4,732	3,987
Reproduction	4,318	4,610	3,959[3]
Bristols[4]	6,674	7,178	8,536[3]
Thin papers	4,573	4,747	4,311
Other fine papers	336	380	486
Wrapping papers	148,042	163,716	156,096
Bag papers	27,618	31,312	38,069
Glassine	6,150	7,104	6,845
Greaseproof	2,024	1,991	2,460
Vegetable parchment	2,854	2,532	2,648
Converting papers	59,142	61,629	53,334[2,3]
Wrapping papers	50,254	59,148	52,740[2,3]
Multi-wall sack papers	30,899	34,061	29,869
Special industrial papers	20,195	20,230	15,344[5]
Sanitary papers	65,514	68,004	62,520
Tissue papers	11,721	13,357	12,368
Absorbent papers	7,415	7,106	8,107
Building papers	68,095	72,397	71,266
Paperboard	673,067	764,890	688,401
Container board	308,571	358,143	331,629
Folding boxboard	167,434	190,106	159,717
Set-up boxboard	55,707	63,345	61,285
Cardboard	6,073	6,224	5,145
Building board	80,122	92,733	81,813
Miscellaneous other board	55,160	54,339	48,812
Tube stock	34,335	34,943	29,622

[1]Revised.
[2]Includes a small quantity of paper not classified by type.
[3]Data revised to conform with certain changes in paper and paperboard classifications which became effective beginning January, 1944. For figures covering other months of 1943, see "Facts for Industry," Series 24-2-5, Table 2.
[4]Includes Government Postal Card Stock.
[5]Includes a small quantity of Special Industrial Papers having a basis weight of less than 100 pounds. Such paper was classified as Wrapping Paper prior to January 1944.

To Hold Annual Coating Meeting

The next meeting of the Michigan Division of the American Pulp and Paper Mill Superintendents Association will be held on Thursday, February 15 at the Park-American Hotel in Kalamazoo. Dinner will be served at 6:30 P.M.

Arthur Brooks, technical director of the American Color Type Company, Chicago, will be the speaker. He is also the president of the National Craftsman's Club; Printing and Publishing consultant for some time in Washington. Mr. Brooks will discuss "Printers' Problems and Advertisers' Demands and Their Effect on Coated Papers." Mr. McAneny of the Bradner-Smith & Co., Chicago, will also be present.

Reject United Mine Workers

CHILICOTHE, Ohio, February 5, 1945—At an election held at the plant on January 22 and January 23, the employees of the Chillicothe Paper Company rejected District No. 50 United Mine Workers as their bargaining agent. The election was supervised by the National Labor Relations Board.

HARVESTS ICE TO COOL ACID

(Continued from page 7)

Wausau, Wis., last week recommended to the Wisconsin State Public Service Commission that users of improved water power resources on the Wisconsin river be assessed $112,000 for utilization of the facilities during the last half of 1944.

Under the law, the company reports to the commission twice a year to propose tolls sufficient to pay a 7% return on capital investment in the reservoir system. The commission will hold a hearing February 9 to consider any objections to the assessment recommendations. The proposed assessments:

Wisconsin Public Service Corporation, $26,849; Rhinelander Paper Company, Rhinelander, Wis., $3,776; Nekoosa-Edwards Paper Company, Port Edwards and Nekoosa, Wis., $15,460; Consolidated Water Power and Paper Company, Wisconsin Rapids, $31,170; Tomahawk Kraft Paper Company, Tomahawk, $2,990; Marathon Corporation, Rothschild, $3,325; Mosinee Paper Mills, Mosinee, $2,579; Wisconsin River Paper and Pulp Company, Stevens Point, $678; Whiting Plover Paper Company, $163; Wisconsin Power and Light Company, $18,920.

John Strange to Address Engineers

"The Paper Industry in Post-war Years as the Institute Sees It" is the subject of an address to be delivered at a 6:30 dinner meeting of the Kimberly-Clark chemical engineers Tuesday evening, February 6, by John Strange of the Institute of Paper Chemistry, Appleton, Wis. The meeting will be held at the Copper Kettle, Appleton.

F. W. Braun Heads Safety Council

Fred W. Braun, vice president and chief engineer of the Employers Mutuals, Wausau, Wis., has been elected president of the Wisconsin Council of Safety. Among other positions Mr. Braun has held is that of membership in the executive committee of the paper and pulp section of the National Safety Council. E. A. Page, Neenah, Wis., a vice president of Kimberly-Clark Corporation, is among the officers of the state organization.

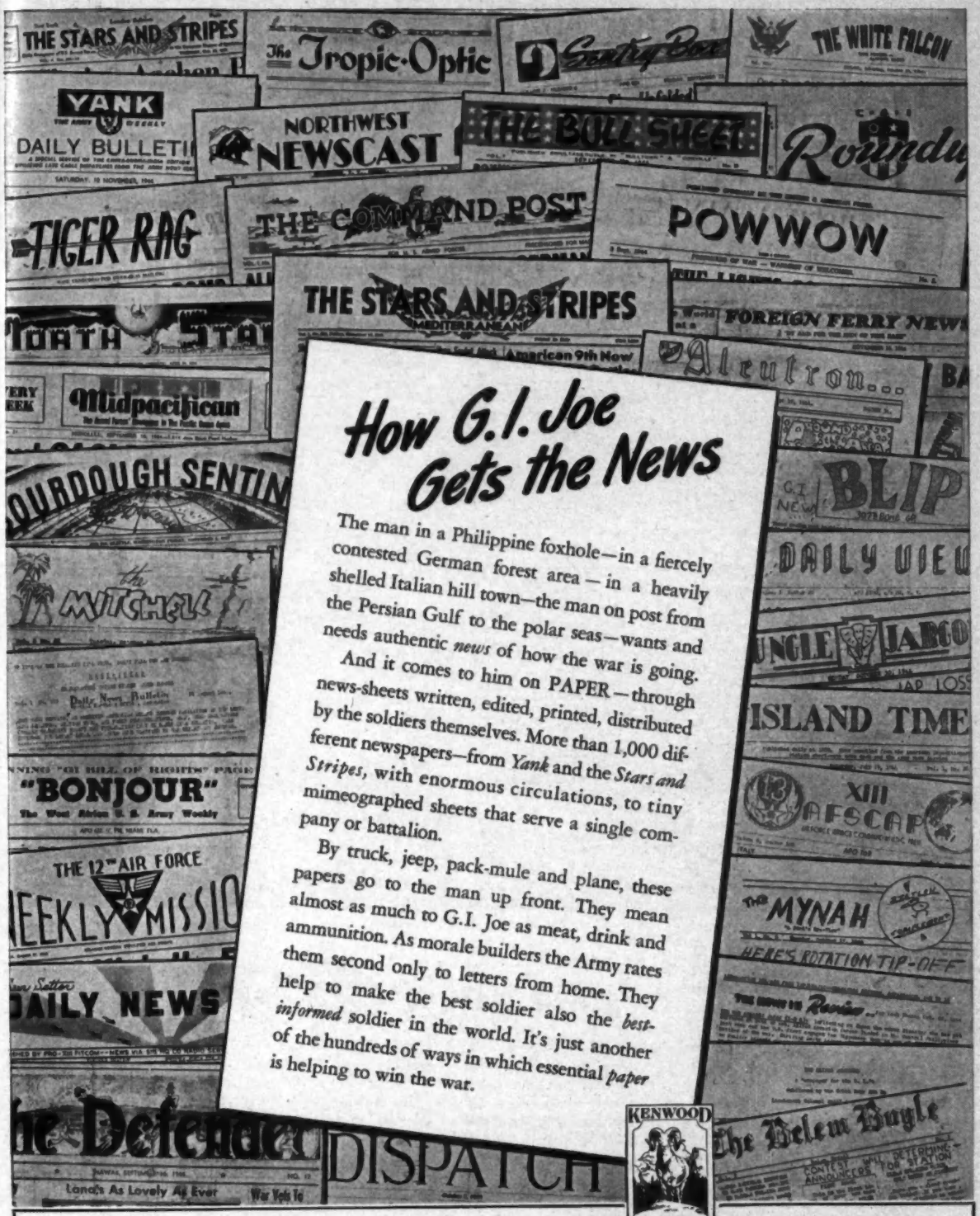
Offers Farmers Free Tree Seedlings

Wisconsin river valley farmers last week were offered two free seedling trees for each tree cut this season, regardless of species or type. Trees for Tomorrow, Inc., a non-profit organization of nine Wisconsin valley paper mills, made the offer to farmers and timber tract owners in the six Wisconsin valley counties of Vilas, Oneida, Lincoln, Marathon, Portage and Wood. The owner estimates the number of trees he will cut and then applies to the organization for seedlings.

Recirculating Air Heater

A new type of heater that recirculates products of combustion is described in Bulletin No. 137, issued by the J. P. Ross Engineering Corporation, 350 Madison avenue, New York 17, N. Y.

This new Ross Recirculating Indirect Air Heater is stated to have a fuel efficiency of 85% and over. The fuel is completely burned in the refractory-lined combustion chamber with a minimum of makeup air. This new Ross heater is being built in only one outlet temperature range, 500° to 600° F. Other Ross heaters permits a large selection of air volumes and outlet temperatures.



How G.I. Joe Gets the News

The man in a Philippine foxhole—in a fiercely contested German forest area—in a heavily shelled Italian hill town—the man on post from the Persian Gulf to the polar seas—wants and needs authentic *news* of how the war is going.

And it comes to him on PAPER—through news-sheets written, edited, printed, distributed by the soldiers themselves. More than 1,000 different newspapers—from *Yank* and the *Stars and Stripes*, with enormous circulations, to tiny mimeographed sheets that serve a single company or battalion.

By truck, jeep, pack-mule and plane, these papers go to the man up front. They mean almost as much to G.I. Joe as meat, drink and ammunition. As morale builders the Army rates them second only to letters from home. They help to make the best soldier also the *best-informed* soldier in the world. It's just another of the hundreds of ways in which essential *paper* is helping to win the war.

KENWOOD WOOL PRODUCTS

F. C. Huyck & Sons is proud to be serving an industry so essential to the war program. Our skill, our facilities and our 75 years of experience are always available in solving the special felt problems created by urgent wartime paper needs.

F. C. HUYCK & SONS

Kenwood Mills

Albany New York

Help make it *easy*

Whether veterans return to jobs or unemployment, whether post-war buyers spend or hoard their hundred billion dollars now in banks and bonds, whether America's transition to a peacetime economy will be smooth or chaotic, *depends* to a large extent on what *you* do *now*.

War production must come first, but many will have died in vain if victory finds us unprepared for peace . . . Every business executive must recognize the importance of his individual part in the planned program of reconversion.

HERE'S THE IDEA . . . (1) Make an immediate analysis of your reasonable needs to begin post-war business. (2) Place unrated orders for this material to be delivered as soon as restrictions permit. (3) Advise your customers to do the same. (4) Keep up-to-date on W.P.B. and O.P.A. rulings.

HERE'S HOW IT WORKS . . . Unrated orders placed *now* permit suppliers to anticipate your needs and begin production on them as soon as the W.P.B. lifts the bars. This assures *you* of a quicker return to civilian business and customers' orders placed *with* you provide a back-log to start you off when Uncle Sam ceases to be the big buyer.

With all business following this plan America will be ready to capture and hold a gigantic world market. The money to prime the pump of business is here—17 billions of foreign dollars in gold and credits as well as our own piled up savings with which to satisfy a four-year accumulation of civilian needs. This plan will provide jobs for G. I. Joe. Your job is to work the plan.

HEPPENSTALL, the most dependable name in forgings

Your personal war effort is important (1) *Push production* (2) *Buy bonds* (3) *Plan for peace*

HEPPENSTALL CO., PITTSBURGH 1, PA.

Reports on Pulpwood Receipts

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., February 7, 1945—Receipts of pulpwood at United States mills during 1944 amounted to 16,468,900 rough cords, which is 11% above 1943 receipts and 2% below those of 1942, the War Production Board's Forest Products Bureau announced today.

Of this amount, domestic production made up 14,818,900 cords and 1,649,900 cords were imported. The domestic production was 13 per cent above that of 1943 and two per cent above that of 1942, WPB officials said, but pointed out that the increase had been more than offset by decreases in exports.

Domestic pulpwood production must reach 16,000,000 cords this year if the heavily-increased military demands and essential civilian needs for pulp and paper products are to be met, the officials said.

Reporting on December pulpwood activity, WPB gave the following facts:

Mill receipts were approximately, 1,101,000 cords, or 14% less than in December 1943. Of this amount 1,007,000 cords were of domestic production and 94,000 cords were imported, with the percentage decline being approximately the same for both categories. The monthly receipts began to fall off in September and the acceleration of the decline in December was attributed to unfavorable weather in the forestry area, uncertainties in the Selective Service Situation and other factors.

There is an imperative need for heavily increased production of long-fibered species (spruce, hemlock and fir) in the Northeast and Lake State mills. In the South the need is for southern pines, while in the Appalachian regions both pine and hardwoods are essential.

Amends Waste Paper Sale Order

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., February 7, 1945—Manufacturers of paper or paper board who use waste paper may not compel converters of the products to furnish them with waste paper as a condition of sales, the Office of Price Administration announced today in an order effective February 10, 1945. The order also prohibits purchasers of paper or paper board from furnishing such manufacturers with waste paper.

This action was taken to preserve normal business methods prevailing in this industry and to correct existing speculative and manipulative practices in waste paper, OPA said.

The order is not intended, however, to prohibit legitimate and useful business transactions and transactions that bring out additional supplies of waste paper. Excluded from coverage by the order are:

1. Waste paper accumulated by a purchaser of paper or paper board in the course of his own converting;
2. Dealers or brokers who legitimately buy and sell waste paper;
3. Sales agents who sell without taking title to waste paper;
4. Persons who accumulate waste paper in "salvage drives" and devote proceeds of sales to public or charitable purposes;
5. Others who create additional sources of supply of waste paper that would not find its way into the normal channels of delivery to manufacturers, and who by application obtain approval of OPA to consummate such sales.

New TAPPI Members

The executive committee of the Technical Association of the Pulp and Paper Industry has elected the following to membership:

Wilmer J. Balster, research and development engineer, Office of the Quartermaster General, Alexandria, Va.

George H. Beisse, shift superintendent, Pulp Division, Weyerhaeuser Timber Company, Longview, Wash., a 1935 graduate of the University of Washington.

L. Hahn, assistant manager, Orient Paper Mills, Ltd., Brajrajnagar (B.N.Ry), Orissa, India, a 1924 graduate of Technical College, Prague.

H. Dudley King, building supervisor, Todd & Brown, Inc., La Porte, Ind., a 1915 graduate of the Illinois Institute of Technology.

Gideon R. Kreider, Jr., treasurer, Lebanon Paper Box Company, Lebanon, Pa., a 1910 graduate of Lafayette College.

Charles A. Martin, traveling engineer, Robert Gair Company, 155 East 42nd street, New York, N. Y., a 1924 graduate of Cooper Union.

Leon J. Paquin, sales service, International Paper Company, 220 East 42nd street, New York, N. Y., a 1934 graduate of the University of Maine.

Karl E. Sundqvist, treasurer and manager of Machinery Department, Elof Hansson, Inc., 10 East 40th street, New York, N. Y., a 1937 graduate of Gothenburg Commercial College, Sweden.

Must Protect Forest Wealth

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., February 5, 1945—Ontario Forest Industries Association heard Premier George A. Drew at the annual dinner here January 31, stress the need for cooperation between the government and wood industries in the protection of Ontario forests. Premier Drew said "I do not believe in compulsion or in the intervention in the business details, but the interests of the public in the forest wealth must be protected."

Officers chosen by the association are: President, Earl Rowe; Vice-presidents, M. Cochran, K. O. Roos; manager, W. A. Delahey; directors, C. B. Davis, A. E. H. Fair, D. A. Gillies, Col. W. H. Milne, B. F. Mervin, E. E. Johnson, A. McN. Austin, R. D. Prittie, F. W. Hutchinson, M. Cochran, H. P. Klinestiver, H. Mosher, W. H. Nasi, Maj.-Gen. H. Kennedy, A. G. Ponsford, J. S. Wilson, P. H. Scowen, A. H. DeWolfe, and K. O. Roos.

R. W. Shaver Heads Gould Paper Co.

Roy W. Shaver of Scarsdale, N. Y., has been elected president and general manager of the Gould Paper Company, Lyons Falls, N. Y., succeeding Gordon H. P. Gould, the company announced yesterday. For five years he has been with the Riegel Paper Corporation of New York in charge of that concern's southern timber interests.

Holyoke Card Co. Names Directors

SPRINGFIELD, Mass., January 29, 1945 — The Holyoke Card and Paper Company announces the election of Ralph L. Hartwell as a director and executive vice-president in charge of manufacturing and the election of F. Allan Barr as a director and vice-president in charge of sales.

GENERAL AMERICAN IS

MODERNIZE YOUR MILL

with

General American Process Equipment

TO MEET POST-WAR COMPETITION

Reduce Labor and Upkeep Costs!

Reduce Soda Loss by Installing the Most Modern Equipment in Your RECAUSTICIZING PLANT!

All major units — slakers, causticizers, thickeners, filters and lime-burning kilns — manufactured in our own shops under most modern conditions by experts in the most exacting types of war work and in the fabrication of equipment from stainless steels and stainless clad materials.

Engineered and watched by one supervisor with a staff skilled and experienced in every step and thoroughly familiar with the problems of recausticizing in Pulp Mills throughout the country.

You know the soda make-up per ton of pulp *but do you know* how much of this loss is from your present RECAUSTICIZING UNIT? Perhaps this can be halved with better equipment and better supervision. *Let us study the situation with you* and make recommendations for lower operating costs.

Conkey Evaporator Equipment for the pulp mill comprises a modern line of Long Tube Film Type Evaporators for multiple effect economy in the concentration of soda and sulphate black liquors: forced circulation high concentrators for carrying concentration to ultimate high density; and improved recirculation types for the concentration of sulphite mill waste liquors.

Special features of Conkey evaporator design assure minimum entrainment losses; high heat transfer; accessibility; entirely automatic control; low maintenance and supervision costs.

OTHER CONKEY PRODUCTS FOR PULP MILLS INCLUDE:

Long Tube Film Type Evaporators

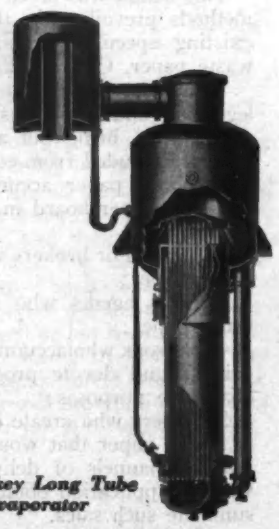
Forced Circulation Evaporators

Waste Sulphite Evaporators

Electrolytic Caustic Evaporators

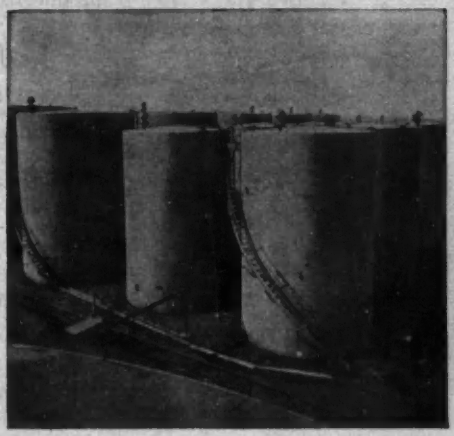
High Concentrators

Digester Circulation Systems



Right: A Conkey Long Tube Film Type Evaporator

EQUIPMENT HEADQUARTERS!



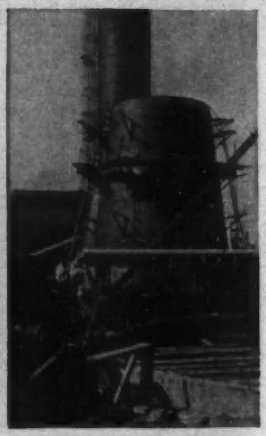


PLATE FABRICATION (EITHER WELDED OR RIVETED)

The General American line also includes all the multitude of plate-fabricated equipment manufactured by the Plate & Welding Division at Sharon, Pa.

Accumulators, agitators, autoclaves, air receivers, bins, car tanks, boiler drums, condensers, columns, digesters, heat exchangers, dryers, filters, mixing and blending tanks, fractionating towers, stacks, storage tanks of all sizes for water, oil, molasses, alcohol, gasoline and other products; stills, scrubbers, large diameter welded or riveted pipe, refinery equipment including all types of pressure vessels, and general plate fabrication—in carbon, stainless and alloy steels, Everdur, aluminum and other special alloys. . . . Built to API-ASME, ASME or other codes. General American maintains a complete laboratory for physical and chemical testing. . . . X-ray facilities. . . . Heat treating and stress relieving furnaces. . . . Completely equipped organization for foreign and domestic field erection of shop prefabricated units.

WRITE for all the FACTS!

In addition to its excellent production facilities, General American offers you a unique combination of research and engineering skills. Its Research and Development Laboratories at Sharon and Louisville are models for the industry. We would be glad to send you full information about any of our products—our research and development facilities—our ability to serve you well. Correspondence with engineering firms is especially invited. *Address:*

GENERAL AMERICAN
TRANSPORTATION CORPORATION

PLATE & WELDING DIVISION
PROCESS EQUIPMENT DIVISION

GATX GENERAL AMERICA

General Sales Offices: 420 Lexington Avenue, New York 17, N. Y.

Works: Sharon, Pa., and Louisville, Ky.

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FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending February 3, 1945

STOCKS

	High	Low	Last
A. P. W.	5⅛	5	5
Armstrong Cork Co.	45⅛	45	45⅛
Celotex Corp.	16¼	15⅝	16¼
Celotex Corp., pf.	19⅜	19	19⅜
Certain-Teed Products Corp.	8¾	8⅝	8¾
Certain-Teed Products Corp., pf.	143	139	142½
Champion Paper & Fibre Co.	31½	30⅝	31⅜
Champion Paper & Fibre Co., pf.	114¾	114	114¾
Congoleum Nairn Co.	27⅜	27¼	27¼
Container Corp. of America	28⅝	28¼	28½
Continental-Diamond Fibre Co.	12⅛	11½	12
Crown-Zellerbach Co.	21⅜	21	21⅛
Crown-Zellerbach Co., pf.	105	104	105
Dixie Cup Co.	20	19½	20
Dixie Cup Co.,—A	49	48¾	49
Flintkote Co.	26¼	24⅞	26
Flintkote Co., pf.	109	109	109
Robert Gair	6⅜	5¾	6⅛
Robert Gair, pf.	17¾	17½	17⅝
International Paper Co.	20¾	19⅝	20½
International Paper Co., pf.	90½	86¾	90
Johns-Manville Corp.	110	105¾	110
Johns-Manville Corp., pf.	...	...	...
Kimberly-Clark Corp.	42½	42	42
Mac Andrews & Forbes	32	31	32
Mac Andrews & Forbes, pf.	...	...	...
Masonite Corp.	44⅜	43	43¼
Mead Corp.	14	13½	14
Mead Corp., pf. A—6%	100½	99½	100½
Mead Corp., pf. B—5½%	97	95	97
National Container Corp.	14¼	13⅜	14¼
Paraffine Companies, Inc.	58	57	58
Paraffine Companies, Inc., pf.	...	...	...
Rayonier, Inc.	17⅜	16½	17⅛
Rayonier, Inc., pf.	35½	34¾	35½
Ruberoid Co.	36	34¾	36
Scott Paper Co.	44	44	44
Scott Paper Co., pf.	113½	109½	110
Sutherland Paper Co.	...	...	...
Union Bag & Paper Corp.	15	14¾	15
United Paperboard Co.	7⅜	7	7¼
U. S. Gypsum Co.	82	80¼	82
U. S. Gypsum Co., pf.	183¾	183¾	183¾
West Virginia Pulp & Paper Co.	25¼	24⅜	25⅛
West Virginia Pulp & Paper Co., pf.	109	109	109

BONDS

Abitibi Pulp & Paper Co. 5s '53	101	100⅞	100⅞
Celotex Corp. 3¾s '55	...	...	...
Certain-Teed Products Corp. 5½s '48	103	102¾	103
Champion Paper & Fibre Co. 4¾s '50	...	...	...
International Paper Co. 6s '55	108¾	108¼	108¾
International Paper Co. 5s '47	104¾	104½	104½
Mead Corp. 3½s '53	...	...	...
West Virginia Pulp & Paper Co. 3s '54	...	...	...

New York Curb Exchange

High, Low and Last for Week Ending February 3, 1945

STOCKS

	High	Low	Last
Great Northern Paper Co.	37½	36¾	37½
Hummel-Ross Fibre Corp.	7⅜	7¼	7⅜
St. Regis Paper Co.	6⅞	6¼	6¾
St. Regis Paper Co., pf.	...	...	...
Taggart Corp.	6	5¾	6

BONDS

American Writing Paper Co. 6s '61	101	101	101

Offers Powell River Co.'s Stock

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., February 5, 1945—Considerable interest is shown in financial circles here in the offering of 300,000 shares of stock of Powell River Company, Limited, a newsprint company located some seventy miles north of Vancouver. Hitherto a "private" company, the present offering permits public participation, and it is anticipated that in due course the shares of the company will be added to those which are now being traded on the Montreal Stock Exchange.

The offering is being made at $18.50 a share. It does not represent new financing by the company, but shares made available by shareholders.

The Powell River Company has been a family concern since it was established in British Columbia by Dr. Dwight F. Brooks and his partner, M. J. Scanlon, of St. Paul, Minnesota, thirty-four years ago. It has no bonds outstanding and is arranging to convert its preferred stock into common, so that the only outstanding securities of the company will be 1,344,695 no par value ordinary shares, of which the 300,000 now being offered form a part.

The Powell River Company has been successful from its very beginning, and even during the dark period of the middle thirties there was no year in which it did not make a profit. In 1944 the company earned $1,750,000, after depreciation and taxes, or $1.30 per share, in addition to which the refundable tax equalled 28 cents a share.

The Powell River Company is one of the largest producers of newsprint west of the Great Lakes.

Johns-Manville Earns $6.39

The report of the Johns-Manville Corporation, issued to stockholders by Lewis H. Brown, president, discloses consolidated net earnings of $5,476,213 for 1944, equal to 5.4 cents in the sales dollar and to $6.39 a share of common stock. Consolidated net earnings for 1943 were 4,655,280 or $5.27 a common share.

Before taxes of all kinds, earnings last year amounted to $14,765,345, or $1,418,706 less than in 1943. The decrease was due to "lower sales and increased costs of operation, offset in considerable part by a reduction of $2,260,000 in provision for contingencies," the report notes. Sales totaled $101,211,499 compared with $107,418,305 in 1943 and the record volume of $108,021,383 in 1942.

"For the third succesive year," Mr. Brown declared, "the demands of war and the uncompromising compulsions of a war economy continued to govern the pace and pattern of operations. Orders for products for war service and essential civilian use were at a high level throughout the year, but as many plants are in areas of critical labor shortage, production was dependent on severely depleted manpower."

Scott Co. Declares Dividend

The Scott Paper Company, Chester, Pa., has declared a quarterly dividend of 45 cents per share on the company's outstanding common shares, payable March 12 to shareholders of record at the close of business February 26.

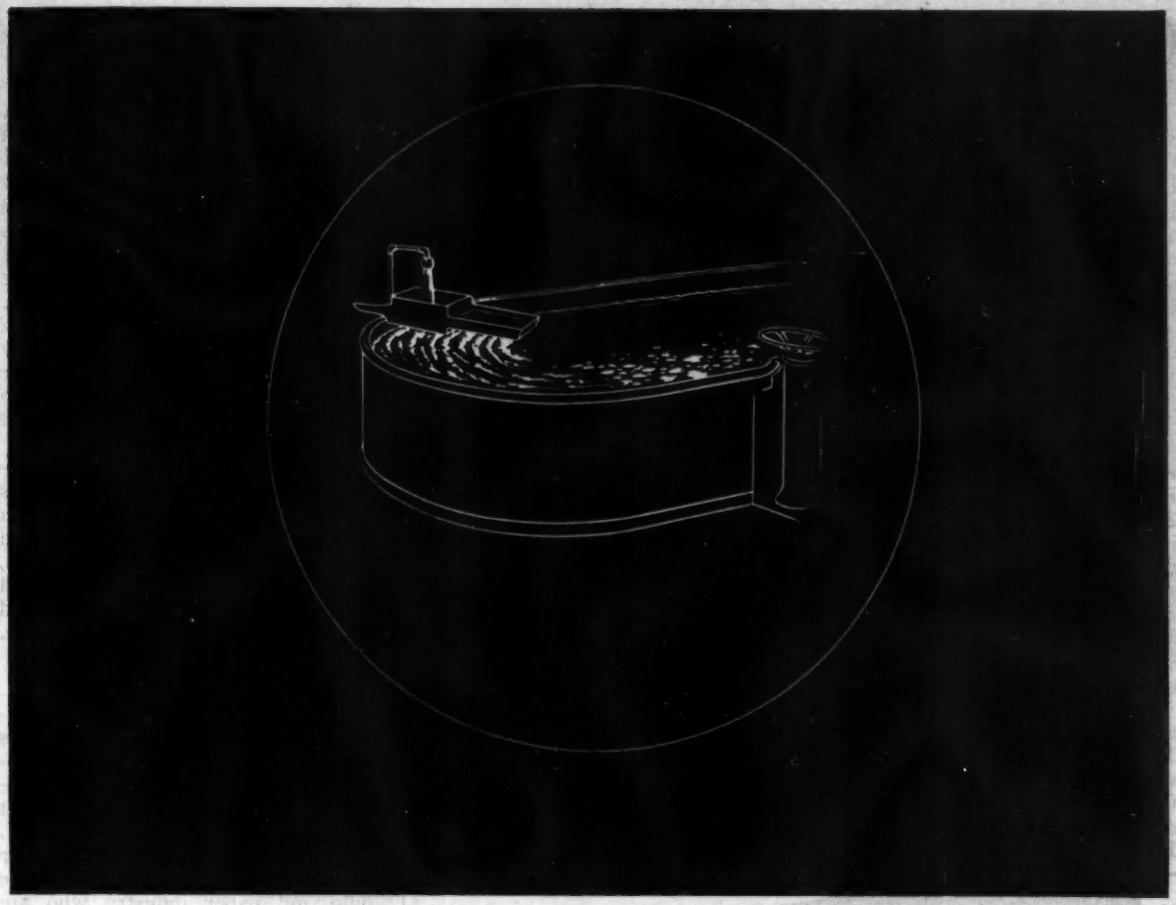
The regular quarterly dividend of 1.12½ per share was declared on the company's outstanding $4.50 cumulative preferred shares, and the regular quarterly dividend of $1 per share on the company's outstanding $4 cumulative preferred shares, both such dividends to be payable May 1, to shareholders of record at the close of business April 20.

Paraffine Co.'s Earn $2.04

Paraffine Companies, Inc., for the six months to December 31, reports a net profit, subject to renegotiation, $1,020,790, or $2.04 a common share, against $945,783, or $1.89 a common share for final six months of 1943. December quarter: Net profit $570,884, or $1.14 a common share against $520,181, or $1.05 a share, for quarter ended December 31, 1943.

S. D. Warren Votes Dividend

At a meeting of the board of directors of the S. D. Warren Company, a quarterly dividend of 50 cents on the common shares was declared, payable March 1 to stockholders of record February 15.



Start Slime Control Here!

This is the "spot" to add "Lignasan"—the powerful bactericide and fungicide that controls slime-forming bacteria. Chances are that the pulp and water in your storage chest or connecting pipes will become infected with slime. *Don't risk this costly gamble!* Add "Lignasan"! As a beater disinfectant, from 3 to 5 ounces per ton of fiber, dry basis, is frequently sufficient to control slime throughout *all* the "wet" paper-making processes. Puts an end to clogged screens, excessive scrap and wasted labor.

Use "Lignasan," too, as a spot treatment wherever slime persistently forms. As little as 3 to 5 ounces of "Lignasan" per ton of fiber, dry basis, bled into the head-box prevents the formation of slime on the paper machine.

Get the facts today on how "Lignasan" can help you control slime, preserve pulp, prevent clogging of alum lines and keep your mill operating at *top* efficiency. Write our nearest branch office or E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Wilmington 98, Delaware.

Controls slime
Preserves pulp

Du Pont Lignasan
REG. U. S. PAT. OFF.
BACTERICIDE AND FUNGICIDE

DU PONT
BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

Germany Loses One Half of Her Pulp Supply

The spectacular Russian offensive of the last few weeks has deprived Germany not only of her supply of Hungarian meat, Rumanian oil, East Prussian grain and Silesian coal and ore but also a very substantial part of her supply of pulp and paper, according to Charles R. A. Hartig, vice president of Bomall & Co., Inc.

In Esthonia eight pulp and paper mills with a production of about 130,000 tons fell to the Russians when Tallin (Reval) was captured. Another eight mills with an estimated production of 70,000 were taken, when the Soviets surrounded Riga. Polands pre-war pulp production was 214,000 tons; all Polish mills are now in Russian hands. From Slovakia fighting has been reported in the pulp towns of Turiansky Sv. Martin, Zilina and Ruzomberok, where about half of Czechoslovakia's 350,000 tons of sulphite pulp is being manufactured.

With the occupation of Lithuania the Russians took the well known Memel pulp mill in the territory which was incorporated into the Greater Reich in 1938, with a production of 50,000 tons. In East Prussia are 4 large pulp mills, two of them around Koenigsberg belonging to the Feldmuehle group and one each at Tilsit and Ragnit belonging to the Waldhof combine.

In Silesia the Russians announced recently the capture of Cosel where another Waldhof mill is located and Ziegenhals the home of the Tillgner Sulphite pulp mill is within the range of the Soviet guns.

Further pulp and paper mills may be scratched off the German list of suppliers if the Russians continue their advance to the West. On the shore of Pomerania are the new kraft mill at Koeslin and the ancient Hammermuehle at Varzin. In the Oder estuary around Stettin are the large pulp and paper units of the Feldmuehle, which together with the East Prussian mills, already in Russian hands, produced in peace times 927 tons paper and 610 tons pulp daily. Further south in Silesia, Bohemia and Saxony is another center of the Reich's fiber and paper industry.

While our Russian allies are reducing the German pulp and paper supply from the East the Americans, British and French are fighting in, around or above many towns of which the names are familiar to the pulp and paper trade in this country. The two strongpoints of the Siegfried Line Dueren and Juelich were well known papermill towns. Not far away from the front is Bergisch Gladbach the home of the famous Zanders mill, the large pulp mill at Walsum on the Upper Rhine and the kraft mill at Neuss, north of Cologne.

Mannheim, Frankfurt and Mainz have been pounded from the air innumerable times and it would be purely accidental if the large pulp mills of Waldhof, Kostheim and Okriftel should not have been hit.

Germany being cut off from imported cotton and wool by 5½ years of blockade and depending upon woodpulp not only for paper and board but for most of her textiles, plastics and explosives will soon feel the loss of what can be estimated to be almost one half of her supply.

OPERATES SO QUIETLY

The unusually quiet operation of Reading Electric Hoists is due to the use of worm gear speed reduction.

Quiet operation also means less wear of moving parts and therefore a minimum of maintenance. Low cost maintenance also results because there are only three moving parts of the hoisting mechanism proper. High precision anti-friction bearings are another factor in the smooth, quiet operation of Reading Electric Hoists.

It will pay you to investigate the money saving features of Reading Electric Hoists. For full technical information, write for Bulletin 1004.

READING CHAIN & BLOCK CORPORATION
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CHAIN HOISTS • ELECTRIC HOISTS • OVERHEAD TRAVELING CRANES

READING HOISTS

Taylor Catalog Revision

A number of important revisions have been made in the new Flex-O-Timer Catalog No. 98154, just published by the Taylor Instrument Companies of Rochester, N. Y. These changes will be of particular interest to production men in the pulp and paper industry who are now studying their product with an eye to increasing output, improving quality, or reducing costs by the use of Time Cycle Controllers.

The purpose of the Flex-O-Timer is to time precisely the sequence and duration of operations involving temperature, pressure, humidity or combinations of each.

Operators of platen presses or other applications which require frequent changes in the duration of one phase of a cycle will read with interest the section devoted to the small Auxiliary Timer which fits in the case of the Flex-O-Timer. Explanation of this Auxiliary Timer is accompanied by diagrams of several typical platen press installations for plastic molding.

Large, clear photographs show some of the latest applications of the Flex-O-Timer in such processes as the curing of synthetic rubber tires, the coordinated control of a package dye machine, steam peeling of root vegetables and tobacco conditioning. Manufacturers of standard machinery used in these and many other comparable processes are discovering the sales advantages of equipping their products with Flex-O-Timers right at the factory.

New Hydraulic Pumps

Adding to their line of hydraulic pumps, which previously included hand and foot operated models for delivering pressures from 1000 to 3000 lbs. psi, Lyon Raymond engineers have now developed a two-speed foot pump for pressures up to 10,000 lbs. psi.

An outstanding advantage of this new pump is the automatic change speed feature. The pump has two pistons—one a high speed, low pressure piston, the other a small, slow speed, high pressure piston. Up to 1000 lbs. pressure both pistons pump oil, but at 1000 lbs. the high-speed, low pressure piston automatically cuts out and higher pressures (up to 10,000 lbs.) are easily developed by the small high pressure piston.

A great many applications calling for hydraulic pumps, require first of all that a volume of oil be delivered, and secondly that high pressures be developed. A typical example is the furnishing of power to a hydraulic cylinder where the ram must be extended a large portion of its total travel before it contacts the work and then high pressure must be applied for the final operation. This pump will provide the fast travel at low pressure, thus minimizing the delay in bringing the ram to the work, and without an increase of effort on the part of the operator, develop high pressures for the actual work. Maximum pressure can be pre-determined by the adjustment of a relief valve.

New Wood Product Words

Chemistry and the woodworking industries are moving so fast in the field of research and discovery that new materials derived from wood are being produced under new names at an amazing rate, according to Professor Alfred H. Bishop of the New York State College of Forestry, Syracuse University.

Such words as "compreg," "impreg," "papreg," "tekwood," "staypak" and "Arboneeld," are looming large on the horizon of business. Resin-forming chemicals, salts, dyes, mechanical pressure and heat are applied with astonishing results in transmuting wood into substances that have few characteristics of wood, but which provide new and better products than wood itself.

Just as the world was becoming familiar with the words cellophane, rayon, masonite, veneer, plywood and laminated wood, these new names and new wood products are appearing in the laboratories and in many lines of manufacture. These materials, most of them war-born, are near miracles in which wood has been transformed into substances as hard and strong as metal, substances that will not warp nor check, that can be molded into almost any shape, that are fire and moisture-resistant, and free from insect attack and decay.

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Post-War Pigments

Rhode Island Laboratories, Inc., of West Warwick, R. I., manufacturers of luminescent pigments which are marketed under the trade name of Violite, has published an interesting booklet offering an extensive study for the post-war uses of these pigments.

The booklet contains many illustrations showing how these pigments may fit into the post-war picture.

The booklet is designed to stimulate post-war considerations in many fields including plastics, automotive, advertising, safety devices, textiles, jewelry, electrical appliances, and many others.

It is being offered free upon written request on company stationery.

PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Henry J. Berger, Editor

COMING EVENTS IN PAPER INDUSTRY

The American Paper and Pulp Association and affiliated organizations, The Technical Association of the Pulp and Paper Industry, and The National Paper Trade Association, because of war conditions, have cancelled their conventions which were tentatively arranged to be held in New York, February 19-22, 1945.

New England Section. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel. Holyoke, Mass.

Delaware Valley Section. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club. Philadelphia, Pa.

Lake States Section. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

Kalamazoo Valley Section. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

Empire State Section. Technical Association of the Pulp and Paper Industry—Second Thursday of each month at the Woodruff Hotel, Watertown, N. Y.

Chicago Professional Paper Group—Third Monday of each month, except July and August at Chicago Bar Association, Chicago, Ill.

POST-WAR PULP PRODUCTION

An analysis of wood pulp production based upon a careful study of all available sources, indicates that United States production in the first year of victory in Europe will be 10,658,000 tons; in VE-2, 11,244,000 tons, and in VE-3, 11,694,000 tons. This compares with consumption of 12,378,000 tons in VE-1, with 12,882,000 tons in VE-2, and with 13,289,000 tons in VE-3. These figures thus indicate that consumption will be in excess of production by 1,728,000 tons in VE-1, by 1,638,000 tons in VE-2, and by 1,595,000 tons in the third year of victory in Europe.

In contrast with the estimated supply and requirements of the United States, total world output (excluding the U. S.) is estimated at 13,690,000 tons in VE-1, against consumption of 11,444,000 tons; an output of 15,121,000 tons in VE-2 against consumption of 13,359,000 tons in VE-2, and an output of 17,043,000 tons in VE-3, against an estimated consumption of 15,335,000 tons. The total world supply of wood pulp (excluding the U. S.) is thus estimated at 2,246,000 tons above consumption in VE-1, 1,762,000 tons above in VE-2, and 1,708,000 tons above in VE-3.

In interpreting these figures, presented in the study, "The World's Paper and Wood Pulp Industry Before and After V-E Day," issued by the Department of Commerce on January 26, 1945, the following excerpts are made from the above publication relating to the estimated productive capacity of the leading pulp producing nations of the world: Production of wood pulp in the Northern European countries in the first year after V-E Day is estimated at 4,377,000 tons, to which may be added 600,000 tons of Swedish pulp now in storage, making a total of 4,977,000 tons. Sweden's pulp and paper production facilities are not only intact but improved. Its principal problems in resuming world trade are clearance of shipping lanes and general release of shipping from war transport. Sweden's economic situation is reported to be good. The facilities for producing higher grades of pulp have been increased, but at the expense of the lower unbleached grades and also at the expense of paper pulps, for the improvements permit a substantially larger output of dissolving pulps for rayon and other non-paper manufacture. Sweden will obviously be affected by the heavy demand for lumber in Europe after the war. However, this is not likely to affect pulp production noticeably unless some international agreement interferes. There is evidence to believe that after the war Sweden will be interested in increasing its exports of paper. Undoubtedly this would entail a relatively small reduction in wood pulp exports.

In Norway there has been some destruction of pulp and paper mill properties, also destruction of standing timber and some over-cutting. Many Norwegian mills have been operated during the German occupation. Some have been closed down. All mills are probably in need of extensive overhauling and replacement of equipment. Norway's chief handicap after the war will be lack of adequate stocks of wood. Approximately half of the normal pre-war wood pulp production in Norway was groundwood pulp. Shifting to the production of paper for export in place of pulp is probably more urgent in Norway than in either Sweden or Finland because of relatively higher wood costs.

Finland presents a different picture, having suffered serious losses in manpower and in pulp and paper capacity in the war. Several of Finland's important mills are located in territory which has now been ceded to the Soviet Union. The exact boundary of this territory has not yet been officially announced. Even a slight shift, unfavorable to Finland, can substantially increase the number of mill properties involved in change of boundary. As of December 1944, it is estimated that Finland has lost approximately 22% of its pulp and about 15% of its paper capacity. Finland is obligated to make reparation payments of $300,000,000, in money or in kind during the next six years. It is a foregone conclusion that pulp, paper and lumber must bulk large in this payment. The recovering of the Finnish industry is likely to be slower than in other northern countries. The most serious shortage is undoubtedly the lack of mill stocks of wood, which cannot be quickly replenished.

Austria, Czechoslovakia, Germany, Italy, and Poland are the Central European countries in which area was the world's second largest producer of paper and paper board. The V-E years show it as being the world's fourth largest producer. Some of these countries produced substantial quantities of wood pulp as well as paper in pre-war years. Germany was the largest producer, but its industry was not self contained. It imported large quantities of pulpwood from other countries in the group and from the U.S.S.R. Germany and Czechoslovakia were important exporters of both wood pulp and paper. Neither

Italy nor Poland were able to meet their own requirements. Substantial over-cutting of forest resources has undoubtedly occurred in Germany and Poland. In all these countries established forestry practices have been sacrificed. Basically, however, the forest resources of this sector are by no means insignificant. They have supported thriving industries in the past. But it is doubtful if they can support pulp and paper production at pre-war levels in the V-E years.

The other European countries include Bulgaria, Estonia, Greece, The Karelian Isthmus, Latvia, Lithuania, Portugal, Spain, Switzerland, Turkey, Union of Soviet Socialist Republics and Yugoslavia. For the most part this area ranks in sixth or seventh place in world production and consumption for both paper and wood pulp. In the V-E years this area will not produce enough paper or wood pulp to satisfy needs. During each successive V-E year it will tend to satisfy more and more of its own paper needs but will be less and less able to satisfy wood pulp needs.. There is some evidence that immediately prior to the war, pulp production in the Soviet Union had been increased substantially and that high quality bleached pulps were being produced. The entire pulp and paper production was reserved for domestic use and there was practically no import or export trade before the war. Although the Soviet Union possesses great forest areas of certain pulping species, it is not likely to be in the V-E years an exporter of either paper or wood pulp.

Century to Handle Longfellow Cover

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., January 29, 1945—The Century Paper Company, Inc., has become distributor for Pejepscot Paper Company's Longfellow Cover.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1944		Corresponding Weeks—1943	
Dec. 23	85.5	Dec. 25	68.6
Dec. 30	61.0	Jan. 1'44	70.3
Jan. 6'45	81.0	Jan. 8	90.2
Jan. 13	88.7	Jan. 15	89.5
Jan. 20 (Revised)	87.1	Jan. 22	86.1
Jan. 27	*88.4*	Jan. 29	89.1

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1943	87.2	88.9	89.5	86.7	91.4	84.8	84.3	91.0	88.3	89.6	89.6	82.0	87.8
1944	88.7	88.5	88.1	87.6	88.7	89.8	80.3	90.6	88.2	92.5	91.9	*84.4*	88.4

COMPARATIVE YEARLY SUMMARIES

	1937	1938	1939	1940	1941	1942	1943	1944
Year Average	79.8	71.5	83.4	85.6	97.4	90.4	87.8	*88.4*

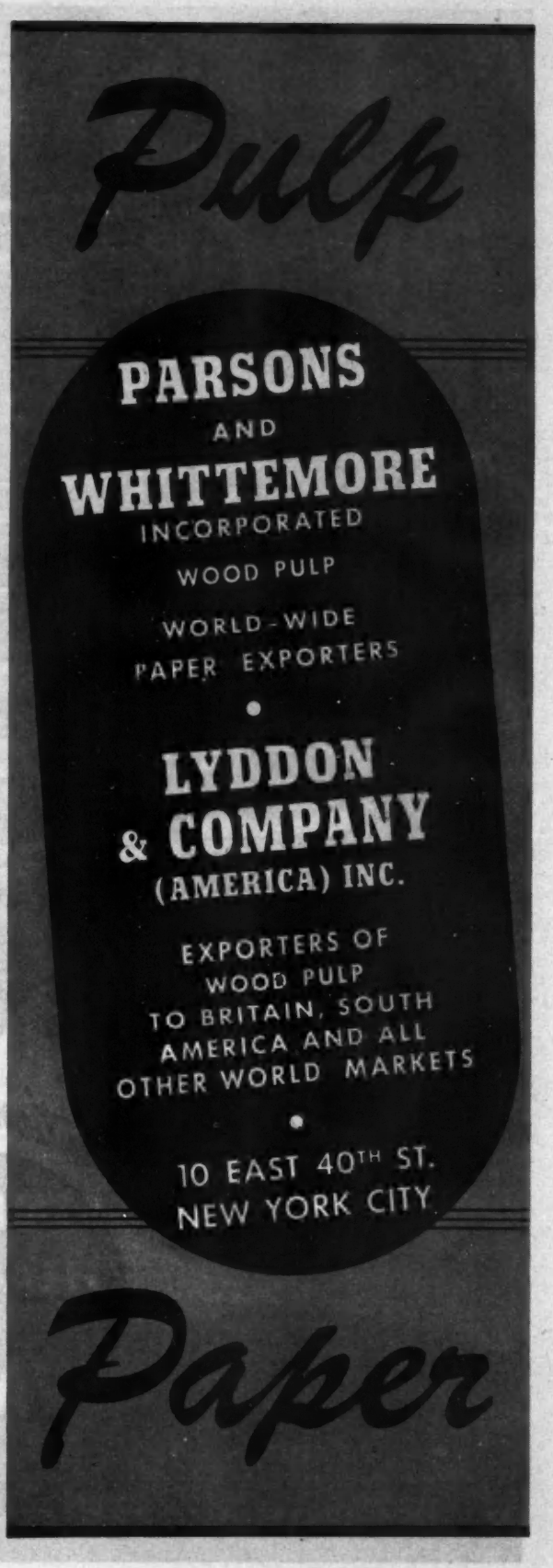
*Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

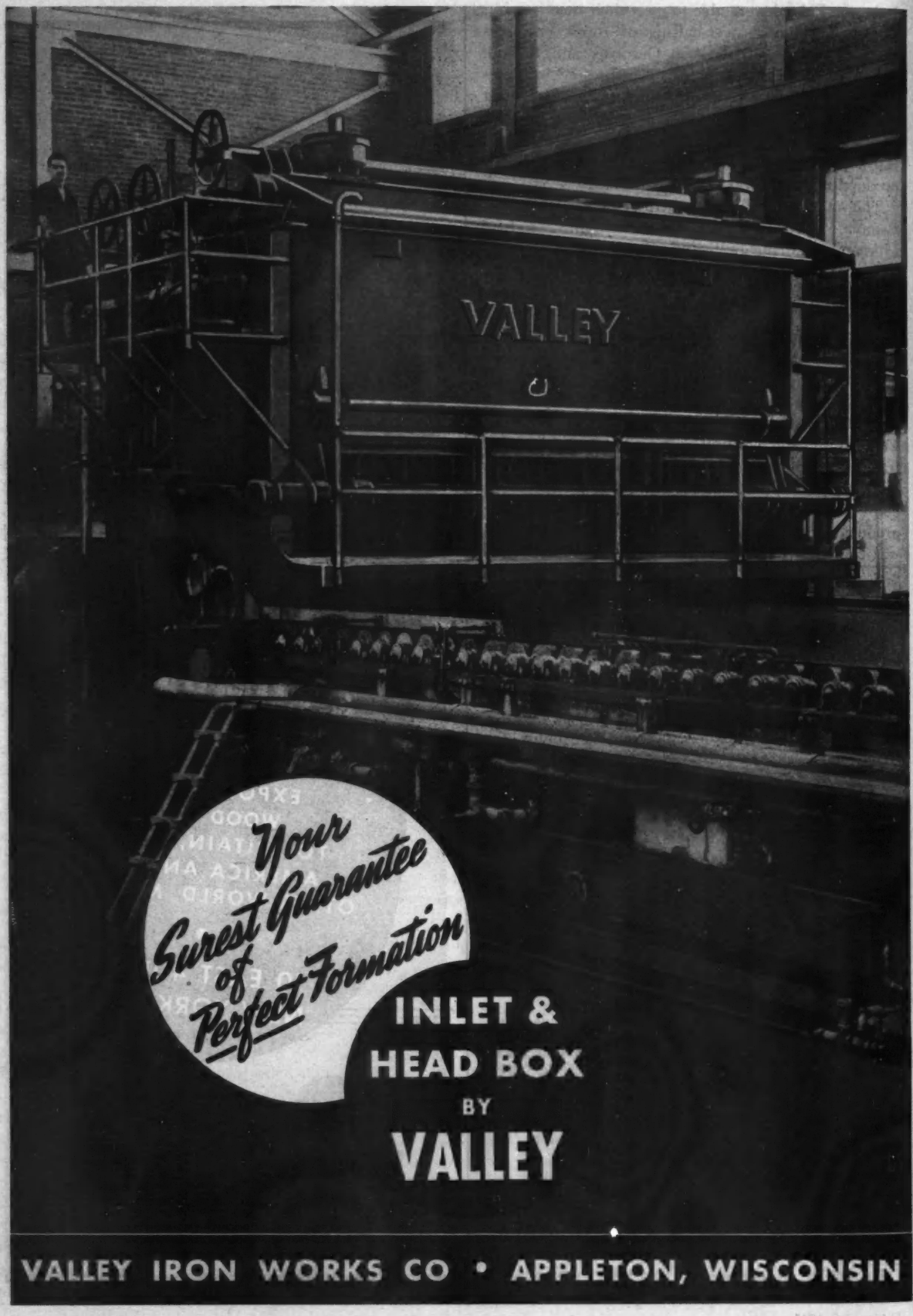
PAPERBOARD OPERATING RATIOS†

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1938	56	63	63	60	60	59	59	69	70	73	67	61	64
1939	65	73	76	74	69	73	68	77	82	91	88	77	77
1940	78	75	74	76	82	85	77	79	78	85	83	77	78
1941	81	88	89	89	91	94	92	98	95	99	98	90	92
1942	102	101	101	95	82	72	68	75	76	81	82	77	84
1943	86	88	94	94	96	94	89	96	94	94	93	87	93
1944	90	96	95	96	96	96	85	96	92	95	95	*85*	93

Week ending Dec. 23, 1944—94 Week ending Jan. 13, 1945—95
Week ending Dec. 30, 1944—57 Week ending Jan. 20, 1945—94
Week ending Jan. 6, 1945—80 Week ending Jan. 27, 1945—*95*

†Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

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OF THE PULP & PAPER INDUSTRY
122 E. 42nd St., New York 17, N. Y.
Edited by R. G. Macdonald, Secretary

United States Patents on Papermaking

Fourth Quarter, 1944

Compiled by Clarence J. West, Chairman, Committee on Abstracts and Bibliography, TAPPI

The following list of patents has been compiled from the current numbers of the Official Gazette of the United States Patent Office. Because, as a rule, only one claim is published in the Gazette, it is not claimed that the list is complete; also, it is possible that the list may contain some patents which do not apply specifically to pulp and paper manufacture.

Copies of any of the following patents may be obtained from the United States Patent Office, Washington, D. C., by sending ten cents in stamps for each patent desired. The number of the patent, the name of the inventor, and the title of the patent should be given in the request. Personal checks and postage stamps are not accepted in payment for patents. Books of coupons may be purchased for two or ten dollars, good for 20 or 100 patents. Coupon orders do not have to be accompanied by letters of transmittal.

October 3, 1944

2,359,278. Method and apparatus for determining the concentration of moisture in materials. Albert Allen and Wilfred H. Howe, assignors to The Foxboro Company, Foxboro, Mass. Filed Feb. 21, 1941. 26 claims. (Cl. 73-76). The material is heated to a critical equilibrium temperature, this being an indication of the quantity of moisture present.

2,359,297. Package, packing container, and blank therefor. Ernest M. Brogden, assignor to the Manhattan Company, New York, N. Y. Filed Nov. 12, 1938. 17 claims. (Cl. 229-16). A bottle display and carrying package.

2,359,298. Package, container, and blank therefor. Ernest M. Brogden, assignor to the Manhattan Company, New York, N. Y. Filed Nov. 12, 1938. 11 claims. (Cl. 229-16). A display and carrying package for consumer units of merchandise (bottles).

2,359,314. Adhesive sheet. Edward F. Klein and Charles Yates, assignor to Beutex Corporation, Perth Amboy, N. J. Filed Oct. 21, 1939. 5 claims. (Cl. 117-122). The adhesive is a pressure-sealing suphonamide resin, polyvinyl acetate, and a plasticizer.

2,359,335. Container and method of making same. Kimberly Stuart, Menasha, Wis., and Allen B. Wilson, said Wilson assignor to Elizabeth R. B. Stuart, Menasha, Wis. Filed April 9, 1941. 6 claims. (Cl. 229-5.7). A container having a plurality of side walls and a bottom.

2,359,337. Dispensing package. John G. Turek, assignor to Chicago Carton Company, Chicago, Ill. Filed Sept. 14, 1940. 5 claims. (Cl. 206-56). A folding-box construction.

2,359,340. Process of purifying aluminum sulphate solution. John H. Walthall, assignor to Tennessee Valley Authority. Filed Jan. 1, 1943. 4 claims. (Cl. 23-123). A method of removing iron as ferric thiocyanide.

2,359,415. Process for refining tall oil. Frederick H. Gayer and Charles E. Fawkes, assignors to Continental Research Corporation, Chicago Heights, Ill. Filed March 19, 1942. 19 claims. (Cl. 260-97.5). A sulphuric acid solution of tall oil is purified by mixing with a neutral or alkaline mineral salt solution, which concentrates sulphated compounds in the lower layer of the solution.

2,359,417. Method of and machine for stacking and compacting folded plies of paper web. Leslie T. Hand, assignor to Morsegraph, Inc., New York, N. Y. Filed March 2, 1943. 15 claims. (Cl. 270-73). A method of folding and stacking paper.

2,359,440. Method of producing album bag sections. George W. Poppe, assignor to Equitable Paper Bag Co., Inc., Long Island City, N. Y. Filed May 5, 1942. 4 claims. (Cl. 93-35).

2,359,531. Machine for making milk bottle caps. Peter W. Ryser, Portland, Oreg. Filed May 27, 1940. 3 claims. (Cl. 93-1.3). A milk-bottle cap machine.

2,359,543. Apparatus for continuous digestion of fibrous material. Arthur E. Branzell, Lief Glöersen, and Johan C. F. C Richter, assignors to Aktiebolaget Kamyr, Karlstad, Sweden. Filed Sept. 23, 1941. 9 claims. (Cl. 92-7). The apparatus consists of an impregnating vessel and two digesters, with means for moving the material from one to the other and for supplying and removing the cooking liquor from the digesters.

2,359,678. Heavy-duty bottle carrier. William A. Ringler, assignor to The Gardner-Richardson Company, Middletown, Ohio. Filed July 28, 1941. 7 claims. (Cl. 229-16). A bottle carrier formed from a single sheet of board.

2,359,679. Film carton with mailing tag. Bruno C. Roehri, assignor to General Aniline Film Corporation, New York, N. Y. Filed March 10, 1942. 4 claims. (Cl. 229-37).

2,359,714. Method of controlling wood pulp cooking. Robert S. McKay, assignor to Mason-Neilan Regulator Company, Boston, Mass. Filed Nov. 7, 1939. 2 claims. (Cl. 92-7). A method of controlling a series of cooks in a digester each requiring different temperatures at different periods during the cook and the several cooks requiring different maximum temperatures.

October 10, 1944

2,359,831. Apparatus for testing moisture content in granular material. William J. Delmhorst, assignor to Measurements Corporation, Boonton, N. J. Filed Jan. 20, 1940. 14 claims. (Cl. 23-253). The method involves the use of calcium carbide.

2,359,832. Dispensing container. Charles H. Duell, assignor to Brisbane Box Corporation, Detroit, Mich. Filed March 6,1943. 13 claims. (Cl. 206-42).

2,359,838. Wax coating machine. Wiltie I. Gladfelter and Frederick W. Duhan, assignors to Crown Cork & Seal Company, Inc., Baltimore, Md. Filed July 29, 1940. 18 claims. (Cl. 91-44). An apparatus for coating cans.

2,359,858. Water-resistant starch and paper containing it. Ralph K. Iler, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed Nov. 26, 1942. 12 claims. (Cl. 117-156). Paper contains a reaction product of starch and a water-soluble complex compound of the Werner type, in which a trivalent nuclear chromium atom is co-ordinated with a carboxylic acido group having at least 10 carbon atoms.

2,359,882. Container and end closure therefor and method of making. Bernard F. Sir, assignor to Williams Brothers, St. Joseph, Mich. Filed Oct. 12, 1942. 8 claims. (Cl. 229-5.5).

2,359,891. Groundwood bleaching process. Paul S. Braillier and Edmund S. Nowicke, assignors to Stauffer Chemical Company, Niagara Falls, N. Y. Filed Dec. 2, 1940. 3 claims. (Cl. 8-105). Mechanical pulp is subjected for 1 hour at 50° C. to the action of calcium hypochlorite and sodium hydroxide at a pH of 9.5 to 11, with sufficient sodium metasilicate to maintain the pH during the bleaching operation.

2,359,904. Glue spreading machine. Frank Fluckinger, Seattle, Wash. Filed Oct. 8, 1941. 4 claims. (Cl. 91-49).

2,359,986. Divisible carton. Louis P. Greeco, Portland, Oreg. Filed Nov. 21, 1941. 10 claims. (Cl. 229-37).

2,360,044. Comb or stripper for gumming mechanism and the like. John Dermody, assignor to Economic Machinery Company, Worcester, Mass. Filed June 28, 1941. 3 claims. (Cl. 91-58).

2,360,117. File box closure. Harry L. Fellowes, assignor to Bankers Box Company, Chicago, Ill. Filed Nov. 12, 1942. 4 claims. (Cl. 229-44).

2,360,252. Dry mounting tissue. Carl J. Malm and Gordon D. Hiatt, assignors to Eastman Kodak Company, Rochester, N. Y. Filed Dec. 12, 1941. 2 claims. (Cl. 117-122). A tissue-like supporting material is coated on each side with a cellulose acetate butyrate, an alkyd resin, and a plasticizer.

October 17, 1944

2,360,415. Reclosure carton. Clyde L. Gilbert, assignor to American Coating Mills, Inc., Elkhart, Ind. Filed June 14, 1943. 5 claims. (Cl. 229-17).

2,360,435. Apparatus for partially folding containers. Clair L. Martin, assignor to The American Paper Bottle Company, Toledo, Ohio. Filed June 12, 1941. 4 claims. (Cl. 93-36.8).

2,360,439. Container. Charles Z. Monroe, assignor to The American Paper Bottle Company, Toledo, Ohio. Filed March 10, 1941. 13 claims. (Cl. 229-17). A container constructed to facilitate the formation of a pouring spout.

2,360,510. Bagmaking machine and method of producing bags. John L. Murray, assignor to Pneumatic Scale Corporation, Limited, Quincy, Mass. Filed Jan. 19, 1942. 18 claims. (Cl. 93-3). Means for inserting a string and sealing the mouth of the bag.

2,360,597. Merchandise wrapping. Walter L. Topolski, Chicago, Ill. Filed Oct. 31, 1942. 1 claim. (Cl. 229-51).

2,360,720. Block-bottom closure for multiply paper bags or sacks. Foster G. Robinson, assignor to Paper Sacks Limited, Bristol, England. Filed Jan. 29, 1943. 4 claims. (Cl. 229-57).

2,360,765. Dispensing carton. Bruce J. Davidson, assignor to National Biscuit Company, New York, N. Y. Filed Jan. 11, 1943. 12 claims. (Cl. 206-56).

2,360,773. Fourdrinier wire change. Francis A. Helin, assignor to The Bagley and Sewall Company, Watertown, N. Y. Filed July 7, 1942. 3 claims. (Cl. 92-44). A method for changing Fourdrinier wires.

2,360,779. Method of screening and washing paper pulp. Frank J. Lang and George R. Jaegerm assignors to International Paper Company, New York, N. Y. Filed July 31, 1940. 6 claims. (Cl. 92-20). Alkaline pulp suspension is passed over a rotary knotter which is rotated at a peripheral speed not exceeding five feet per minute to avoid foaming of the black liquor and washing the accepted pulp to remove the black liquor.

2,360,806. Carton. Robert Van Rosen, assignor to J. Makowsky, New York, N. Y. Filed Feb. 2, 1944. 10 claims. (Cl. 229-16).

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2,360,825. Coating paper. Philip S. Blickensderfer, assignor to The Champion Paper and Fibre Company, Hamilton, Ohio. Filed Dec. 18, 1942. 6 claims. (Cl. 117-44). A method of maintaining the condition of the casting surface beyond the edges of the paper web, which comprises maintaining on these portions of the casting surface a film of water-soluble oil and continuously washing from the film any coating material which may be deposited thereon.

2,360,828. Coating compositions. William L. Craig, assignor to R. T. Vanderbilt Company, Inc., New York, N. Y. Filed May 28, 1942. 4 claims. (Cl. 106-157). The coating mixture consists of minerals and pigments, sufficient protein to satisfy the specific protein absorptive capacity of the filler, adding raw starch, and subjecting the mixture to the action of an amylolytic enzyme.

2,360,846. Machine for making and filling packages. Wilhelm B. Bronander, Montclair, N. J. Filed Oct. 15, 1941. 10 claims. (Cl. 93-3).

2,360,854. Pulp beating engine. George W. Dodge, assignor to Paper and Industrial Appliances, Inc., New York, N. Y. Filed Oct. 21, 1941. 8 claims. (Cl. 92-24).

2,360,918. Wallboard machine and method. Verner Wade, assignor to Fairmont Box Company, Fairmont, W. Va. Filed Aug. 2, 1940. 30 claims. (Cl. 117-43). A method of coating perpendicular edge surfaces of wallboard.

2,360,919. Method of coating paper. Edgar Werner, assignor to The Champion Paper and Fibre Company, Hamilton, Ohio. Filed July 5, 1940. 9 claims. (Cl. 117-64). Water is applied to the paper web other than by absorption from the coating, in amount sufficient to wet web, before evaporation of moisture from the freshly applied coating has been completed and causing at least a part of the evaporation of the moisture from the coating to take place through the web while it is wet.

2,360,931. Carrying case. Morton S. Brockman, Cleveland, Ohio. Filed Nov. 8, 1941. 1 claim. (Cl. 229-52).

2,360,947. Moistureproof pellicle. Albert Hershberger, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed Oct. 23, 1934. 1 claim. (Cl. 117-146). The moistureproof coating consists of a resin-like rubber derivative (Plioform type) 27, gum damar 55, montan wax 15, and benzyl abietate 3 parts.

2,361,052. Apparatus for producing bags. William S. Patterson, assignor to Pneumatic Scale Corporation, Limited, Quincy, Mass. Filed Oct. 8, 1943. 2 claims. (Cl. 164-42). A means for advancing in a straight path a connected strip of filled and sealed bag sections a distance of one bag length each cycle of operation.

2,361,124. Locking tab. Norbert A. Ringholz, assignor to The Hinde & Dauch Paper Company, Sandusky, Ohio. Filed Sept. 28, 1942. 4 claims. (Cl. 229-45).

2,361,150. Method and apparatus for admitting chlorine to a liquid stream. Gregory A. Petroe, assignor to The Mathieson Alkali Works, Inc., New York, N. Y. Filed Jan. 24, 1941. 8 claims. (Cl. 8-156). A method of dispersing chlorine throughout a body of paper pulp.

2,361,264. Rewinding machine. Peter J. Christman, assignor to Paper Converting Machine Co., Inc., Green Bay, Wis. Filed March 6, 1944. 17 claims. (Cl. 242-56).

2,361,265. Rewinding machine. Peter J. Christman, assignor to Paper Converting Machine Co., Inc., Green Bay, Wis. Filed April 20, 1944. 11 claims. (Cl. 242-56).

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2,361,408. Container and method of manufacture. George A. Moore, New York, N. Y. Filed March 3, 1943. 15 claims. (Cl. 229-14). A container for food products.

2,361,418. Adhesive composition. John E. Robinson, assignor to American Can Company, New York, N. Y. Filed Feb. 26, 1941. 2 claims. (Cl. 260-27). A thermoplastic adhesive for fiber container joints consists of about 60% of polymerized vinyl acetate and about 40% of pine wood pitch.

2,361,597. Box or container. Kenneth T. Buttery, assignor to Sutherland Paper Company, Kalamazoo, Mich. Filed July 15, 1942. 5 claims. (Cl. 229-51).

2,361,603. Collapsible Paperboard Box. Samuel L. Cohen and Morton J. Margolles, Brooklyn, N. Y. Filed Feb. 5, 1943. 4 claims. (Cl. 229-39).

2,361,639. Process for defibering lignocellulosic materials. William K. Loughborough, assignor to the Secretary of Agriculture of the U. S. A. Filed July 15, 1940. 3 claims. (Cl. 92-6). The chips are soaked for one hour in a solution of urea, thiourea or a mixture of the two at a temperature of about 220° F. and then defiberized at 150° to 225° F.

2,361,650. Two compartment box. Roy C. Potts, Takoma Park, Md. Filed April 26, 1944. 6 claims. (Cl. 229-27).

2,361,659. Box or container. Richard E. Smith, assignor to Sutherland Paper Company, Kalamazoo, Mich. Filed July 15, 1942. 4 claims. (Cl. 229-51).

2,361,673. Handle forming tape. Joseph A. Young, Salt Lake City, Utah. Filed Aug. 11, 1943. 2 claims. (Cl. 229-52).

2,361,733. Supporting structural wallboard unit. Byron J. Bartholomew, Burton, Ohio. Filed April 26, 1943. 2 claims. (Cl. 154-45.9).

2,361,751. Reinforced laminated fibrous sheet and method of making the same. Frank E. Donovan, assignor to Specialty Converters, Inc., Braintree, Mass. Filed Dec. 24, 1942. 3 claims. (Cl. 154-2).

2,361,856. Tension control for paper rolls and the like. Joseph E. McMullen and Charles Stenger, Milwaukee, Wis. Filed July 9, 1943. 7 claims. (Cl. 242-58).

2,361,876. Package and method of forming same. John P. R. Schell, Hollywood, Fla. Filed Feb. 26, 1941. 17 claims. (Cl. 229-14).

2,361,877. Package. John P. R. Schell, Harpersville, Ala. Filed Aug. 5, 1943. 6 claims. (Cl. 229-14).

2,361,879. Cigarette package. Johannes Schumann, Philadelphia, Pa. Filed April 28, 1943. 3 claims. (Cl. 206-41.2).

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2,361,923. Box. Edwin L. Arneson, assignor to Morris Paper Mills, Chicago, Ill. Filed July 5, 1941. 12 claims. (Cl. 206-7). A knock-down box.

2,361,926. Package, Container, and blank therefor. Ernest M. Brogden, assignor to the Manhattan Company, New York, N. Y. Filed Nov. 12, 1938. 13 claims. (Cl. 229-52). A display and carrying package for bottles, etc.

2,361,942. Machine for making fiber container parts. John M. Hothersall and John H. Murch, assignors to American Can Company, New York, N. Y. Filed Dec. 28, 1939. 12 claims. (Cl. 93-36).

2,361,950. Coating apparatus. Russ B. Leech, assignor to Standard Process Corporation, Chicago, Ill. Filed April 15, 1941. 12 claims. (Cl. 91-33). Apparatus for smoothing and levelling thermoplastic coating material on a web.

2,361,959. Coating machine. Nicholas Pelosi, assignor to American Can Company, New York, N. Y. Filed Nov. 23, 1940. 2 claims. (Cl. 91-55). A machine for coating containers with paraffin and the like.

2,361,960. Sorting device for container making machines. Nicholas Pelosi, assignor to American Can Company, New York, N. Y. Filed Jan. 24, 1941. 6 claims. (Cl. 209-81). A detecting and stacking mechanism for fiber container parts.

2,361,984. Telescopic box. Marshall I. Williamson, assignor to National Folding Box Company, New Haven, Conn. Filed Oct. 28, 1941. 2 claims. (Cl. 229-23).

2,362,060. Plasterboard. Joseph J. Etridge, John B. Sandford, and Victor Lefebure, assignors to Imperial Chemical Industries Limited, London, England. Filed Sept. 29, 1941. 9 claims. (Cl. 154-45.9). The cement consists of calcium sulphate, blast furnace slag, and available lime as an exciter.

2,362,168. Registering device in the manufacture of paper boxes. John S. Stokes, Huntingdon Valley, Pa. Filed July 13, 1943. 13 claims. (Cl. 93-54). A method of registering box blanks and adhesively coated wrappers.

2,362,181. Shipping or mailing containers. Morton W. Zimmerman, Brooklyn, N. Y. Filed Dec. 12, 1940. 2 claims. (Cl. 229-6).

2,362,238. Glue spreader, surface coater, and the like. John E. Black and Robert S. Black, Mendota, Ill. Filed Aug. 1, 1942. 2 claims. (Cl. 192-130).

2,362,344. Apparatus for measuring moisture. Leonard D. Baver and Byron T. Shaw, assignors to The Ohio State University Research Foundation, Columbus, Ohio. Filed Dec. 31, 1940. 2 claims. (Cl. 73-75). A heat conductivity-moisture determining apparatus.

2,362,373. Method for applying adhesive to wax coated paper. Harold E. Hallman, Catonsville, Md. Filed April 14, 1941. 3 claims. (Cl. 154-40). An adhesive is applied to the thicker coating of wax on the paper and is simultaneously heated to melt the wax so that the adhesive strikes through to the paper, and a wax-coated paper is applied on the heated adhesive to join the two webs.

NOVEMBER 14, 1944

2,362,462. Bag closing machine. Daniel Belcher and Frank R. Linda, assignors to Bemis Bro. Bag Co., Minneapolis, Minn. Filed April 8, 1940. 9 claims. (Cl. 226-56).

2,362,496. Double post card and return envelope. George Jo Mess, Indianapolis, Ind. Filed May 13, 1943. 7 claims. (Cl. 229-73).

2,362,595. Ice cream cone holder. Theodore E. Tossison, Robbinsdale, Mass. Filed Sept. 30, 1943. 4 claims. (Cl. 229-1.5).

2,362,862. Paper container for fluid, Melvin H. Sidebotham, Newton, Mass., assignor of one-half to Harlow M. Russell. Filed July 15, 1942. 5 claims. (Cl. 229-37).

2,362,884. Process of making aluminum coated paper. John W. Clark, assignor to S. D. Warren Company, Boston, Mass. Filed April 9, 1941. 1 claim. (Cl. 117-71). A mineral-coated and calendered paper is treated with a composition containing 100 parts of aluminum powder, a wetting agent, and 15-35 parts of a water-dispersible protein adhesive, so that 1 to 5 pounds of adhesive-aluminum composition is added per ream of paper, the coating is dried, the surface moistened, and the coated paper severely supercalendered.

2,362,942. Pour spout carton. Kenneth F. Spaulding, assignor to F. Dorsey Montgomery, Chicago, Ill. Filed June 4, 1942. 3 claims. (Cl. 229-17).

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2,362,973. Noncrystallizing rosin size and method of making the same. Jack T. Cassaday, assignor to American Cyanamid Company, New York, N. Y. Filed Jan. 22, 1942. 6 claims. (Cl. 106-238). An aqueous liquid rosin size resistant to crystallization upon storage consists of an alkali metal soap of a rosin having dissolved therein 0.25 to 3% of its weight of sulphur.

2,362,990. Bottle holder. Walton B. Crane, assignor to Morris Paper Mills, Chicago, Ill. Filed Aug. 24, 1940. 7 claims. (Cl. 224-45).

2,362,995. One-piece, handled bottle carrier. Clyde L. Gilbert, assignor to Morris Paper Mills, Chicago, Ill. Filed March 6, 1942. 15 claims. (Cl. 229-28).

2,363,150. Chemical manufacture. Walter L. Savell, assignor to The Mathieson Alkali Works, Inc., New York, N. Y. Filed Oct. 9, 1941. 4 claims. (Cl. 252-183). Soda ash and sulphur are added to molten black ash, the mixture passed through a charge of coke in the presence of sufficient air to maintain reducing conditions (whereby the sulphur is converted to sodium sulphide), and the reduced mixture is dissolved in water to form green liquor.

2,363,255. Paper boring and slotting machine. James W. Lee and Freeman Barney, assignors to The Challenge Machinery Company, Grand Haven, Mich. Filed Feb. 14, 1941. 8 claims. (Cl. 164-86).

2,363,289. —Method of moistureproofing cellulosic sheets. Frank D. Bergstein, Cincinnati, Ohio. Filed June 21, 1940. 4 claims. (Cl. 117-145). The coating material contains a wax, a hydrocarbon polymer produced by hydrogenating raw rubber and polymerizing isobutylene, and cyclized rubber.

2,363,311. Planographic printing plate. Arthur Garrett, assignor to Dun & Bradstreet, Inc., New York, N. Y. Filed June 11, 1942. 2 claims. (Cl. 101-149.2). This is an unbacked sheet of supercalendered amyloid parchment paper with a smoothness of 47 seconds (Williams) and a gloss of 40 (Bausch & Lomb).

2,363,330. Safety paper and preparation thereof. Donald T. Jackson and John L. Parsons, assignors to Hammermill Paper Company, Erie, Pa. Filed July 22, 1940. 20 claims. (Cl. 117-1). Paper is treated with a light-stable organic compound containing a heterocyclic ring.

2,363,352. Closure for paper containers. Frank J. O'Brien, assignor to Continental Can Company, Inc., New York, N. Y. Filed Oct. 18, 1943. 6 claims. (Cl. 229-5.5).

2,363,417. Method of and apparatus for making zigzag or fan-folded assemblies of series connected envelopes. Vincent E. Heywood, assignor to United States Envelope Company, Springfield, Mass. Filed July 15, 1941. 4 claims. (Cl. 93-61).

2,363,425. Method of making paperboard containers. Clarence F. Klein, assignor to Frankenberg Bros., Inc., Columbus, Ohio. Filed Sept. 18, 1943. 6 claims. (Cl. 93-36). Method of making inner lined paperboard boxes.

2,363,439. Felted water-resistant sheet fiberboard. Herman W. Richter, assignor to George O. Jenkins Company, Bridgewater, Mass. Filed July 25, 1940. 4 claims. (Cl. 106-156). A fiberboard useful for heel bases consists of cellulosic and leather fibers and a bituminous pitch type base.

2,363,442. Pneumatic means for stripping laminated paper stock. Arthus L. Scott, assignor to Frankenberg Bros., Inc., Columbus, Ohio. Filed Sept. 18, 1943. 3 claims. (Cl. 93-36). A heater for softening the adhesive and removing the severed region of a blank from the lining material.

2,363,472. Mailing card. Louis S. Ritter, Darien Conn. Filed Dec. 10, 1941. 5 claims. (Cl. 229-92.8).

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2,363,480. Forming fibrous felts. Robert N. Brownlee, assignor to Wood Conversion Company, Cloquet, Minn. Filed Aug. 10, 1942. 7 claims. (Cl. 154-33). A method of forming a fiber blanket by depositing substantially individualized vegetable fibers carrying liquid to render the fibers adhesive to form a mat while employing an impact of each fiber on already deposited fibers and compacting the mat.

2,363,661. Carbon paper and its holder. William J. Feitl, Chicago, Ill. Filed May 12, 1944. 4 claims. (Cl. 282-19).

2,363,786. Cylinder machine construction. Philip H. Goldsmith, Wilmington, Del. Filed Nov. 18, 1941. 7 claims. (Cl. 92-43).

2,363,861. Carton. Charles H. Goodyear, assignor to Fibreboard Products, Inc., San Francisco, Calif. Filed May 24, 1943. 10 claims. (Cl. 229-51). A carton with a plurality of hingedly connected walls.

2,363,866. Apparatus for applying and sealing gummed tape. Ferdinand W. Humphner, assignor to Mid-States Gummed Paper Co., Chicago, Ill. Filed Dec. 15, 1941. 4 claims. (Cl. 93-56).

2,363,925. Separation of tall oil into components. Frederick W. Adams, assignor to Pittsburgh Plate Glass Company, Allegheny County, Pa. Filed Dec. 19, 1941. 4 claims. (Cl. 260-97.5). Tall oil is separated into a fraction rich in fatty acids by means of naphtha and one rich in resin acids by means of the methyl ether of ethylene glycol.

2,363,926. Bag closure. Egmont Arens, assignor to The Great Atlantic & Pacific Tea Company, New York, N. Y. Filed March 12, 1943. 1 claim. (Cl. 229-62).

2,363,957. Envelope or container. George H. Goff, Fitchburg, Mass., assignor to The Brown Bag Filling Machine Company. Filed Dec. 2, 1942. 2 claims. (Cl. 229-85).

2,363,971. Ventilated shopping bag and the method of constructing the same. Morris Katz, Bronx, N. Y. Filed July 1, 1943. 6 claims. (Cl. 93-35).

2,364,001. Translucent fiber tissue pressure-sensitive adhesive tape. Gustave Schieman, assignor to International Plastic Corporation, Morristown, N. J. Filed Dec. 2, 1942. 1 claim. (Cl. 154-43). A flexible base, a pressure-sensitive adhesive coating on one side of said base and a thin flat sheet of paper tissue applied to the adhesive coating.

2,364,009. Method and means for making bags. Charles Tessendorf and Frank J. Gruper, Jr., assignor to Marathon Corporation, Menasha, Wis. Filed Nov. 9, 1942. 6 claims. (Cl. 93-27). Apparatus for forming bags from tubes of heat-sealable sheet material.

2,364,012. Container. Richard R. Walton, John J. Austin, and Gordon E. Gott, assignor of one-half to Container Corporation of America, Chicago, Ill., and one-half to Dewey and Almy Chemical Company, Cambridge, Mass. Filed May 17, 1941. 5 claims. (Cl. 229-14). A shipping carton.

December 5, 1944

2,364,086. Coating apparatus. Leo Meister, Irvington, N. J. Filed Aug. 31, 1942. 5 claims. (Cl. 91-39).

2,364,112. Manufacture. Bliss Van Every, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed Nov. 24, 1942. 2 claims. (Cl. 88-109). A regenerated cellulosic sheet wrapping material containing an organic compound absorbing substantially all light of the wave length of 3000 to 3800 A.

2,364,171. Pulp screen. Stephen A. Staege, assignor to The Black-Clawson Company, Hamilton, Ohio. Filed July 8, 1940. 16 claims. (Cl. 92-34).

2,364,177. Manufacture of bleached kraft pulp. Sidney D. Wells, assignor to The Institute of Paper Chemistry, Appleton, Wis. Filed May 1, 1942. 6 claims. (Cl. 92-9). In a balanced system for the manufacture of kraft pulp, sodium sulphide liquor is prepared by reacting electrolytic hydrogen with sulphur and passing the hydrogen sulphite into the sodium hydroxide obtained in the electrolysis and the kraft pulp is bleached, in part, by the electrolytic chlorine and, in part, by hypochlorite.

2,364,234. Container and method of making the same. Jacque C. Morrell, Chevy Chase, Md. Filed Aug. 12, 1942. 4 claims. (Cl. 229-5.7).

2,364,244. Defibering apparatus. Cyrus E. Roberson, assignor to The Noble & Wood Machine Company, Hoosick Falls, N. Y. Filed June 28, 1943. 4 claims. (Cl. 92-20). A charging and a receiving chest, a head box surmounting the chests and a fiber selector between the chests.

2,364,267. Carton. Kenneth T. Buttery, assignor to Sutherland Paper Company, Kalamazoo, Mich. Filed June 1, 1942. 3 claims. (Cl. 229-31).

2,364,297. Preformed wrapping for packages. Bill Y. James, assignor of one-half to Caroline Y. James, Miami, Okla. Filed Nov. 9, 1942. 8 claims. (Cl. 229-87).

2,364,324. Blank counter. Edwin G. Staude, Minneapolis, Minn. Filed Aug. 28, 1942. 15 claims. (Cl. 93-93). An apparatus for counting paper articles.

2,364,342. Blank creasing and slotting machine. Hobart W. Bruker, assignor to George W. Swift Jr. Inc., Bordentown, N. J. Filed Jan. 22, 1943. 6 claims. (Cl. 93-58).

2,364,364. Package. Oscar H. Hultin, assignor to Pneumatic Scale Corporation, Limited, Quincy, Mass. Filed Jan. 15, 1942. 9 claims. (Cl. 229-17).

2,364,405. Method and apparatus for separating foreign matter from papermaking material. Edward J. Trimbey and George K. Walker, Glens Falls, N. Y.; said Walker assignor to said Trimbey. Filed Jan. 23, 1940. 10 claims. (Cl. 92-28).

2,364,406. Carton forming machine. John G. Vergobbi, assignor to Pneumatic Scale Corporation, Limited, Quincy, Mass. Filed Jan. 26, 1942. 9 claims. (Cl. 93-36).

2,364,439. Reclosing carton. Reynolds Guyer, assignor to Waldorf Paper Products Company, St. Paul, Minn. Filed July 15, 1943. 9 claims. (Cl. 229-17).

2,364,443. Roll actuating mechanism. Lloyd Hornbostel, assignor to Beloit Iron Works, Beloit, Wis. Filed Nov. 7, 1940. 10 claims. (Cl. 73-141). A stationary and a movable roll positioned for the passage of a fibrous sheet therebetween and means for varying the pressure between the rolls.

2,364,505. Method of making coated papers. Eugene G. Bennett, assignor to The Champion Paper and Fibre Company, Hamilton, Ohio. Filed July 13, 1940. 9 claims. (Cl. 117-62). An aqueous coating composition containing casein and pigment is applied to paper and the casein on the paper is reacted with formaldehyde at a pH of 9-10.5.

2,364,543. Method of forming siftproof bag closures. Royal T. Moore, assignor to Consolidated Packaging Machinery Corporation, Buffalo, N. Y. Filed Oct. 31, 1941. 4 claims. (Cl. 93-61).

2,364,551. Paper bag machine. Frank P. Ramsey, assignor to Arkell & Smiths, Canajoharie, N. Y. Filed March 8, 1943. 4 claims. (Cl. 93-27).

2,364,575. Soap package and method of making same. Frederick J. Warren, assignor to The Warren Soap Manufacturing Company, Inc., Cambridge, Mass. Filed May 10, 1941. 2 claims. (Cl. 229-53). A paper bag for melted soap.

2,364,576. Siftproof package and side seam therefor. Harry F. Waters, New York, N. Y. Filed Sept. 25, 1942. 3 claims. (Cl. 229-14). A flat-folded lined carton.

2,364,590. Starch size. Herman H. Schopmeyer and Herbert A. Kaufmann, assignors to American Maize-Products Company, New York, N. Y. Filed April 8, 1942. 4 claims. (Cl. 195-24). A method of making an enzyme thinned starch size.

December 12, 1944

2,364,650. Bottleholder. Henry K. Powell, assignor to Morris Paper Mills, Chicago, Ill. Filed Feb. 7, 1938. 18 claims. (Cl. 229-52). A knocked-down container for bottles or the like.

2,364,651. Bottleholder. Henry K. Powell, assignor to Morris Paper Mills, Chicago, Ill. Filed March 16, 1938. 21 claims. (Cl. 229-27).

2,364,711. Envelope. Axel H. Hakanson, assignor to United States Envelope Company, Springfield, Mass. Filed Sept. 16, 1943. 2 claims. (Cl. 229-74).

2,364,765. Container and parts thereof. Philip Zalkind, New York, N. Y. Filed May 22, 1939. 1 claim. (Cl. 229-23). A means for connecting adjacent walls of adjacent containers.

2,364,792. Production of zein coating. Albert L. James, assignor to Corn Products Refining Company, New York, N. Y. Filed Jan. 31, 1942. 6 claims. (Cl. 106-153). An aqueous zein dispersion in alkali and a sulphonated vegetable oil is treated with an acetate or formate of aluminum, barium, calcium, tin, copper, lead, etc.

2,364,829. Box. Harold D. Tichenor, assignor to The Wabash Fibre Box Company, Terre Haute, Ind. Filed Oct. 22, 1942. 4 claims. (Cl. 229-39).

2,364,886. Paper bag. Howard A. Wolf, assignor to Wolf Brothers, Philadelphia, Pa. Filed June 23, 1942. 2 claims. (Cl. 229-54).

2,364,888. Web slitting means and method. John A. Aycock, assignor to Rock Hill Printing & Finishing Company, Rock Hill, S. C. Filed Jan. 23, 1943. 7 claims. (Cl. 242-56).

2,364,903. Bag for infusing material. Stanley R. Howard, assignor to Pneumatic Scale Corporation, Limited, Quincy, Mass. Filed Aug. 16, 1941. 1 claim. (Cl. 99-77.1).

2,364,943. Container. Francis L. Brandt, assignor to National Fireworks, Inc., Lynn, Mass. Filed March 13, 1943. 3 claims. (Cl. 229-14).

2,364,965. Dry rosin size. Edmund A. Georgi, assignor to Hercules Powder Company, Wilmington, Del. Filed May 14, 1941. 3 claims. (Cl. 260-105). A mixture of a resin (obtained as a by-product in the refining of FF wood rosin) and a chemically equivalent quantity of aqueous sodium hydroxide is heated at 375-425° F. under a pressure of 125-200 pounds gage and the reaction mixture discharged into a zone at substantially atmospheric pressure and a relative humidity below about 10%, giving a dry resin size with a moisture content less than 3.8% by weight.

2,365,020. Gummed sheet material. Charles W. Stillwell, assignor to Denison Manufacturing Company, Framingham, Mass. Filed Jan. 13, 1943. 24 claims. (Cl. 117-122). The gummed sheet has a coating of a water-activatable adhesive in continuous phase and a deformable resinoid filler in discontinuous phase.

2,365,097. Method of preparing paper coating compositions and the like. Harold R. Murdock, assignor to The Champion Paper and Fiber Company, Hamilton, Ohio. Filed Aug. 31, 1941. 7 claims. (Cl. 106-214). A paper coating composition consists of a mineral pigment and an adhesive derived from rice.

December 19, 1944

2,365,159. Container. Richard R. Walton and David G. Greenlie, assignors of one-half to Container Corporation of America, Chicago, Ill., and one-half to Dewey & Almy Chemical Company, Cambridge, Mass. Filed Aug. 3, 1940. 11 claims. (Cl. 229-14). A container for liquids comprising a liquid-tight bag of thin, flexible sheet material and a carton.

2,365,211. Envelope machine. Abraham Novick, assignor to F. L. Smithe Machine Co., Inc., New York, N. Y. Filed April 20, 1940. 2 claims. (Cl. 93-66).

2,365,261. Carton. William P. Frankenstein, Cincinnati, Ohio. Filed Nov. 17, 1939. 3 claims. (Cl. 229-34).

2,365,271. Drier drum. Lloyd Hornbostel, assignor to Beloit Iron Works, Beloit, Wis. Filed March 22, 1943. 11 claims. (Cl. 257-95). A metallic cylindrical drier drum.

2,365,300. Mixed esters. Ernest Segessemann, assignor to National Oil Products Company, Harrison, N. J. Filed July 6, 1940. 4 claims. (Cl. 260-97.5). A mixed glycerol ester in which at least one of the acyl groups constitutes a residue of the acid in tall oil.

2,365,331. Hollow molded preform of fiber and fusible plastic material. William W. Carter, assignor to Brayton Morton, Boston, Mass. Filed March 27, 1942. 3 claims. (Cl. 229-2.5).

2,365,333. Cardboard carton. Donald F. Cunningham, assignor to Pabst Brewing Company, Chicago, Ill. Filed May 30, 1942. 4 claims. (Cl. 229-52). A combined bottle carrier and carton.

2,365,523. Device for sealing bags. Paul G. Cook, assignor to Union Bag & Paper Corporation, New York, N. Y. Filed Oct. 11, 1941. 12 claims. (Cl. 93-6).

2,365,528. Apparatus for joining the webs of paper rolls. Paul Dietrich, Augsburg, Germany; vested in the Alien Property Custodian. Filed Feb. 16, 1940. 8 claims. (Cl. 242-58).

2,365,529. Apparatus for joining the webs of paper rolls. Paul Dietrich, Augsburg, Germany; vested in the Alien Property Custodian. Filed May 24, 1940. 4 claims. (Cl. 242-58).

2,365,569. Apparatus for detaching the edges of sheet paper and like materials. Allin Larmuth, Broad Oak Park, Worsley, England. Filed Oct. 28, 1943. 5 claims. (Cl. 164-84.5). Apparatus for severing sheet material.

2,365,599. Tanning agent and process for making them. Erik Schirm, Desau, Germany; vested in Alien Property Custodian. Filed June 19, 1941. 8 claims. (Cl. 260-124). Sulphite waste liquor is condensed with an aldehyde and an aromatic polysulphamide.

2,365,600. Storage battery paste and method of making the same. Arlie W. Schorger, assignor to National Lead Company, New York, N. Y. Filed April 3, 1940. 9 claims. (Cl. 136-26). An expander for storage battery plates of the lead acid type comprising finely divided treated natural lignocellulose containing all the natural cellulose and lignin; the product is heated with water at 150-225° C.

2,365,604. Storage battery plates and process for making the same. Alexander Stewart and Eugene Willihnganz, assignors to National Lead Company, New York, N. Y. Filed Dec. 19, 1940. 12 claims. (Cl. 136-27). Natural lignocellulose is heated with water containing 0.5-10% of an acid hydrolyzing agent for 0.25-2 hours at 130-200° C., giving a product to be used as an expander for storage battery plates.

2,365,621. Apparatus for controlling the coating of paper. Robert W. Bender, assignor to Waxide Paper Company, Kansas City, Mo. Filed Aug. 3, 1940. 5 claims. (Cl. 91-31). A means for adjusting the rollers used for coating and/or impregnating paper.

2,365,645. Counting and marking machine. Louis L. Matthews, assignor to Maxson Automatic Machinery Company, Westerly, R. I. Filed Jan. 3, 1941. 88 claims. (Cl. 93-93).

2,365,651. Siftproof bag. James L. Shively, assignor to Crown Zellerbach Corporation, San Francisco, Calif. Filed Nov. 25, 1942. 3 claims. (Cl. 93-35).

December 26, 1944

2,365,665. Machine for sealing boxes. George W. vun Hofe, assignor to New Jersey Machine Corporation, Hoboken, N. J. Filed Nov. 11, 1942. 19 claims. (Cl. 216-55).

2,365,704. Package wrapping. Bill Y. James, assignor of one-half to Caroline Y. James, Miami, Okla. Filed Jan. 2, 1942. 2 claims. (Cl. 229-87).

2,365,739. Container with collapsible closure. Marshall L. Williamson, assignor to National Folding Box Company, New Haven, Conn. Filed Sept. 16, 1942. 11 claims. (Cl. 229-44).

2,365,775. Adhesive-applying apparatus. William F. Punte, assignor to Continental Can Company, Inc., New York, N. Y. Filed March 8, 1944. 10 claims. (Cl. 91-49).

2,365,813. Process for treating fibrous products and products thereof. Earl W. Gluesenkamp, assignor to Monsanto Chemical Company, St. Louis, Mo. Filed Aug. 19, 1942. 19 claims. (Cl. 117-154). A grease- and waterproof paper contains a *N,N'*-dicyldiaminomethane, where the acyl groups are those of fatty acids from 12 to 20 carbon atoms.

2,365,833. Process of incorporating polychlorophenols in fiberboard. Henry L. Morrill and John D. Fleming, assignors to Monsanto Chemical Company, St. Louis, Mo. Insect- and mildewproofed fiber board is made of exploded fibers impregnated with a polychlorophenol, which is precipitated from the sodium salt by the acidic white water.

The Bacteriological Examination of Paper

By John W. Appling[1]

Abstract

The American Paper and Pulp Association initiated in 1939 at The Institute of Paper Chemistry a program of microbiological research which has been carried on with the active co-operation of the mills. This program includes bacteriological surveys of the mills and investigations at The Institute of Paper Chemistry for the purpose of obtaining facts related to bacteriological control in the mills. The surveys made in twelve mills by the Institute and the data collected independently by the mills show extremely wide variations in the bacterial content both in the mill system and in the finished product. Geographically, seven of the mills were located in the Middle West and five in the eastern part of the United States.

Methods of bacteriological control by the mills are briefly discussed in their relation to the bacterial content of the finished paper or board. The bactericidal effect of the drier rolls has been exhaustively studied in certain paper mills and in the laboratories of the Institute. The results show conclusively that certain spore-forming bacteria readily survive passage through the drier section of the paper machine, whereas none of the nonspore-forming bacteria studied survived this treatment. Furthermore, no coliform bacteria were found in any of the hundreds of samples of paper and board which have been examined.

A critical evaluation of the many bacteriological data assembled during the past four and one half years fails to present convincing evidence for the use of the bacterial content of paper and board as the sole criterion for determining its sanitary condition and fitness for use in food packaging. It appears that the suitability of this criterion may have been greatly overemphasized.

Introduction

The American Paper and Pulp Association has recognized the need for correlating activities in connection with bacteriological control in pulp and paper mills and for orienting scientific evidence by having initiated in 1939 a definite program of microbiological research at The Institute of Paper Chemistry. This program has included bacteriological surveys in paper mills and investigations at The Institute of Paper Chemistry for the purpose of obtaining facts related to bacteriological control in the mills. Bacteriological control is recognized and exercised by some mills primarily as a measure of economy and by others as an indispensable means of producing sanitary grades of paper. In order to determine the suitability of a given paper product for sanitary purposes, it is necessary to examine this product by bacteriological methods.

Because dairy products have been packaged in paper extensively for many years, it is not surprising to find that quite a variety of methods has been developed and recommended for the bacteriological examination of paper and paper containers used in packaging of dairy products. Rice *(1, 2)* did some pioneering work in connection with milk bottle caps. His method was to place the entire cap into nutrient agar and to report the presence or absence of bacteria and molds. Oulsen *(3)* of Denmark compared paper and glass milk containers by determining the bacterial content of milk which had been incubated in them. Rice *(4)* also used a similar procedure in addition to a rinse test applied to the empty unused container. Speck and Black *(5)* applied swabbing methods to the examination of open top paper containers for ice cream. Sanborn *(6)* stated that the bacterial content of disintegrated paper board was a more reliable criterion of the sanitary condition of the paper milk container than the rinse test. Tanner *(7)* compared various methods for the bacteriological examination of paper milk containers and stated that the rinse test was the most satisfactory one for routine examination. Wheaton *et al. (8)* reported that 80% of the containers examined were sterile as shown by the rinse test, which had to be modified from that used by the American Public Health Association in order to make more accurate estimates of the small numbers of bacteria present in these containers. Sanborn and Breed *(9)* placed sterile nutrient broth into paper milk containers and incubated them to determine the percentage of sterile containers in addition to the use of the usual rinse test. Mudge and Foord *(10)* described a needle puncture method for sampling the contents of a paper milk container which had been filled with sterile broth and incubated. TAPPI *(11)* has suggested a procedure for the bacteriological examination of paper, which is based on the bacterial content of the disintegrated paper sample. Prucha and Tracy *(12)* applied both the rinse test and the disintegration test to paper milk containers.

The results obtained thus far from the bacteriological examination of paper by the use of these various methods have been very informative to bacteriologists and to papermakers; however, the fundamental question of whether or not there is a public health hazard involved in the use of paper for the packaging of food has not really been answered. The paper industry is anxious to demonstrate conclusively that the use of the paper container represents a decided advance in sanitation and that there is no public health hazard involved in its proper use. The effect of paper containers upon public health has not been decided by the determination of the bacterial content of the board used in its construction. The proposed specifications as described in the U. S. Milk Ordinance and Code *(13)* and by the American Public Health Association *(14)* emphasize the desirability of very low bacterial content in board used in the fabrication of paper milk containers; however, the sanitary reason for this criterion has not been demonstrated. It is well known that the use of paper in food packaging for many years has still to reveal a single case of hazard to public health.

Bacteriological Surveys in Paper Mills

During the first two years of the program of microbiological research sponsored by the APPA,

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the main purpose was to assemble bacteriological data from different types of mills and at different times of the year. It seemed pertinent to ascertain the variation in bacterial content within the same mill during several days of operation, the variation from season to season and the variation from mill to mill. So much attention has been given to the bacterial content of the paperboard used in liquid food containers that it was logical to inquire into the bacteriological condition of the mills producing such paperboard.

This meant (1) that satisfactory methods of taking bacteriological samples had to be selected; (2) that sampling stations had to be similar from mill to mill; and (3) that suitable techniques and facilities had to be available for examining samples promptly. In addition, it was soon found that a single survey, which yielded a set of samples on a particular day, was inadequate as a representation of the bacteriological condition of the mill. Several surveys spaced over a 10-day period were found to be much more significant.

Sampling techniques were carefully considered for all types of samples. One technique was finally adopted for all water samples and mixtures of pulp with water, whereas a different one was adopted for lap pulp and paper samples. In the case of the former, the sampling equipment for each sample consisted of a sterile glass stoppered bottle whose top was protected by a paper cover and a sterile cylindrical metallic scoop designed to enter the mouth of the bottle and protected by a paper wrapper. Two persons were required to take the sample, one opening the bottle at the proper time and the other transferring the liquid sample to the bottle by means of the scoop. The technique for sampling lap pulp and paper required two sizes of sterile heavy kraft envelopes (a small one placed inside a larger one), a sterile knife for cutting, and a pair of sterile forceps. The person taking the sample had to cut it from a sheet of lap pulp or paperboard, or from a roll of paper and transfer it aseptically to the inner envelope, whereupon the outer envelope was sealed with tape. An attempt was also made to determine the bacterial content of the air at various points in the mill. This was done by Well's air centrifuge, by means of which the microbial content of 10 cubic feet of air was determined. This technique was used in five different mills and the results have been summarized in Table I. The first and third columns give the total number of micro-organisms (bacteria and fungi) whereas the second and fourth columns give the percentage of fungi.

TABLE I.—MICROBIAL CONTENT OF PAPER MILL AIR (WINTER—1940)

Type of Paper Mill	Determination Made Near Beaters: Microbial Content in 10 cu. ft. (of Air)	Determination Made Near Beaters: Fungi Present, (%)	Determination Made at Dry End: Microbial Content in 10 cu. ft. (of Air)	Determination Made at Dry End: Fungi Present, (%)
1. Specialty mill—food wrap	184	56.5	68	33.8
2. Specialty mill—food wrap	7	28.6	41	51.2
3. Rag mill	54	66.6	55	3.6
4. Book-paper mill	912	98.2	24	45.9
5. Board mill—utilizing principally waste paper	368	12.8	87	18.4

The number and location of sampling stations naturally varied from mill to mill; however, all points at which changes in bacterial content might be expected were finally selected. In a general way the samples included: (1) untreated fresh (raw) water, (2) treated fresh water, (3) lap pulps, (4) slush pulp, (5) pulp from savealls, (6) sizing, (7) stock ready to leave beaters, (8) stock from machine chests, (9) stock leaving jordans, (10) white water, (11) stock from headbox (and/or vats), (12) water used at calender stack, and (13) paper at the dry end. Each survey gave a set of samples varying in number from twelve to eighteen depending upon the mill. This set of samples was transported to the bacteriological laboratory where they were examined within 6 hours from the time when they were collected.

Methods for the bacteriological examination of various kinds of samples were carefully compared and later incorporated into a suggested standard designated by TAPPI *(11)* as T-449 sm 40. The bacterial content of water and stock suspensions was determined by plating suitable dilutions with standard nutrient agar. In the case of lap pulp and paper samples, the material was weighed into a tared sterile Petri dish, and then disintegrated in water by means of an electric disintegrator. The plating, incubating, and counting procedures were those which were subsequently incorporated into TAPPI Standard T-449 sm 40.

Bacteriological surveys have been made in twelve different paper mills. Most of them manufactured grades of paper and/or board used in food packaging. Five of the twelve were board mills. Geographically, seven were located in the Middle West and five in the eastern part of the United States. The bacteriological examination was usually made at the paper mill by the use of equipment shipped to it from The Institute of Paper Chemistry. This eliminated the need for transporting samples to a distant bacteriological laboratory. The author usually arranged with the co-operating mill to furnish a laboratory assistant to aid in collecting the samples and to help in the laboratory.

The bacteriological examination of the collected samples consisted of the following: (1) plating according to procedures subsequently incorporated into TAPPI Standard T-449 sm 40 *(11)*; (2) determining whether or not each sample contained coliform bacteria by the use of Bacto-Brilliant green bile broth; and (3) differentiating the coliform bacteria found into fecal and nonfecal types by methods outlined in "Standard Methods of Water Analysis" (8th edition) *(15)*.

The bacteriological data collected from the twelve mills are too numerous to be given *in toto* in this paper; however, a large number is given in Tables I-VI. Those of Table I have already been mentioned under air sampling. The data in Table II are given as a typical set from one survey in order to illustrate the method used and to give an idea of the variation from one sampling point to another within the same mill. The untreated fresh water of a river was filtered and chlorinated to maintain a residual of 0.2 p.p.m. of chlorine. No chemical disinfectant was being used in the white water system at the time this survey was made. The general effect of the treated fresh water upon the bacterial content of the mill system was to lower it, as the data clearly show. An increase in the bacterial content of the tray water and white water, as compared with the stock in the headbox, clearly shows the ability of bacteria to multiply in the mill system, unless conditions are made unfavorable for them to do so. The bactericidal effect of the drier rolls is also clearly shown by these data. Assuming a moisture content of 70%

ror the wet web entering the driers and 5% for that of the paper at the dry end of the machine, there was a reduction in bacterial content of approximately 98% in passing through the drier section.

TABLE II.—BACTERIOLOGICAL DATA FROM A SINGLE SURVEY MADE IN A SPECIALTY MILL (No. 11) ON AUG. 28, 1940

Sample	Bacterial Count
1. Untreated fresh water	125,000/ml.
2. Treated fresh water *	2/ml.
3. Washed, partly bleached pulp	120,000/gm.
4. Sizing	364,000/gm.
5. Stock ready to leave beaters	9,800/gm.
6. Stock leaving jordans	4,500/ml.
7. Stock in headbox	6,200/ml.
8. Tray water	20,900/ml.
9. White water (entering beaters)	66,500/ml.
10. Wet web entering driers	6,800/gm.
11. Paper (37 lb.)	390/gm.

* 0.2 p.p.m. of chlorine maintained, no untreated fresh water used in this paper mill.

The data in Tables III, IV and V have been assembled in order to show how much variation may occur in the bacterial content of samples taken at the same point but on different days in the same mill. The data in Table II may also be found in Table III under Mill No. 11. Tables III, IV, and V also show that there was much variation in the bacterial content of comparable samples from mill to mill. It should be noted that Tables III and IV include surveys made when sanitary grades of paper and paperboard were being manufactured, whereas Table V includes those made when nonsanitary grades of paperboard were being made. In the case of the latter, a large proportion of the furnish was waste paper and the product was used in the manufacture of all sorts of shipping cartons. The bacterial content of such boards was usually much higher than that of boards which were made from virgin pulp. This difference is clearly brought out by the data in the last column of Tables IV and V.

The examination of all samples for coliform bacteria and, in the case of many samples, their differentiation into fecal and nonfecal species was made because of the sanitary significance of the former. *Escherichia coli, (E. coli)* is the well-known indicator of sewage pollution in water supplies, whereas *Aerobacter aerogenes* is a nonfecal species of coliform bacteria. The latter has no significance as an indicator of sewage pollution. Unfortunately, perhaps, there are many species of coliform bacteria which are intermediate between *Escherichia coli* and *Aerobacter aerogenes*. These are ordinarily grouped with *Aerobacter aerogenes* from the standpoint of sanitary significance.

TABLE III.—BACTERIOLOGICAL DATA FROM SPECIALTY MILLS (SANITARY GRADES OF PAPER)

Mill No.	Survey No.	Date of Survey	Bacterial Count (per ml.) of: Treated Fresh Water	Reused White Water	Headbox Stock	Bacterial Count (per gram) of Paper at Dry End
2	1—Machine A	3-4-1940	sterile	700	17,200	10
	2—Machine A	3-6-1940	1	9,300	13,300	sterile
	3—Machine A	3-8-1940	sterile	88,000	14,100	30
	4—Machine A	3-11-1940	1	36,100	2,500	10
	5—Machine A	3-12-1940	1	2,940	7,000	30
	6—Machine B	7-25-1940	217*	40,000	29,000	20
	7—Machine A	7-27-1940	1	71,000	127,000*	10
	8—Machine A	7-30-1940	63	18,200	49,000	sterile
6	1—Machine A	11-12-1940	3	40	140*	3,200
	2—Machine A	11-22-1940	24*	250	20*	4,300
	3—Machine A	12-19-1940	16	240	sterile	360
9	1—Machine A	6-26-1940	23	300	390	3,500*
	2—Machine A	7-1-1940	530	1,310	1,700	2,750
10	1—Machine A	6-25-1940	sterile	12,200	14,900	330
	2—Machine A	6-27-1940	7	3,300	2,400	5,320
11	1—Machine A	8-27-1940	4	23,800	2,600	1,200
	2—Machine A	8-28-1940	2	66,500	6,200	390
	3—Machine B	8-30-1940	sterile	271,000	160,000	190
13	1—Machine A	2-4-1941	40	8,600	5,500	130
	2—Machine A	2-5-1941	3	3,000	sterile	90
	3—Machine B	2-5-1941	3	12,500	24,700	20
14	1—Machine A	4-1-1941	sterile	1	800	130
	2—Machine B	4-2-1941	sterile	7	sterile	170
	3—Machine C	4-2-1941	sterile	1	2	50
	4—Machine A	4-4-1941	sterile	1	1	320

* Spreader colony present.

These differential tests were applied to the samples collected in seven of the twelve mills for which bacteriological surveys were made. A summary of the results of these tests is given in Table VI. It can be seen that the indicator of sewage pollution *(Escherichia coli)* was found in 37 samples from these seven mills. However, nine of these 37 samples were untreated fresh water which was sampled merely to serve as a basis of comparison for the treated fresh water. In other words, *Escherichia coli* was found in 28 different samples from the mills. In contrast to this, *Aerobacter aerogenes* and the intermediate types were found in 97 samples which indicates their predominance in the mill samples. It should be noted particularly that coliform bacteria were found only in the wet system of the paper machine and in no

TABLE IV.—BACTERIOLOGICAL DATA FROM BOARD MILLS (SANITARY GRADES OF BOARD)

Mill No.	Date of Survey	Bacterial Count (per ml.) of: Treated Fresh Water	Reused White Water	Vat Stock—Filler	Vat Stock Top Liner	Bacterial Count (per gram) of Board at Dry End: Sample 1	Sample 2
3	3-26-1940	1	7	69,000	sterile	110	450
	3-27-1940	47	42	9	sterile	160	390
	8-8-1940 (A.M.)	7	sterile	2,200	30	40	70
	8-8-1940 (P.M.)	1	sterile	5,400	1,200	80	50
7	6-25-1940	24	sterile	20	not sampled	260	
12	1-6-1941	not sampled	38,000	116,000	6,800	410	
	1-7-1941	10	4,800	189,000	3,800	850	930

TABLE V.—BACTERIOLOGICAL DATA FROM BOARD MILLS (NON-SANITARY GRADES OF BOARD)

Mill No.	Date of Survey	Bacterial Count (per ml.) of: Treated Fresh Water	Reused White Water	Vat Stock—Filler	Vat Stock Top Liner	Bacterial Count (per gram) of Board at Dry End: Sample 1	Sample 2
1	2-26-1940	1	145,000	10,400,000	282,000	125,000	
	2-28-1940	1	420,000	7,300,000	650,000	92,000	
	7-18-1940	600,000	2,780,000	25,300,000	1,920,000	310,000	
	7-22-1940	300	1,590,000	8,600,000	2,540,000	1,700,000	
	7-23-1940	900	1,320,000	11,400,000	1,560,000	3,480,000	
3	3-30-1940	2	270	216,000	200	78,000	97,000
	4-1-1940	20	740	1,210,000	100	150,000	156,000
	8-9-1940	34	250	430,000	12,300	115,000*	104,000*
	8-10-1940	8	96,000	3,800,000	9,300	38,000*	48,000*
12	1-8-1941	10	890,000	109,000,000	336,000	90,000	
	1-9-1941	25	3,800,000	194,000,000	1,410,000	41,000	
		6	53,000,000	297,000,000	46,000,000	78,000	
8	6-29-1940	120	32	.....	230	4,600	
	7-1-1940	40	57	.....	110	2,450	

* Spreader colony present.

case were they found in the paper at the dry end of the machine. The importance of this fact will be discussed at greater length elsewhere in this paper.

Methods Used by the Paper and Board Industry to Achieve Bacteriological Control

The control of micro-organisms, particularly the bacteria and fungi (the more commonly occurring and colored forms of which are called molds), may be accomplished by the close co-ordination of a number of factors. Some of the latter are inherent to the pulp and paper making processes, whereas others may be considered as artificial, although none-the-less necessary. Among the inherent factors which may be useful in bacteriological control are the following: (1) chemical pulping of wood, (2) bleaching operation, (3) moist heat in drier rolls, (4) heat in wet system, and (5) pH of 5.0 or less. On the other hand, the important artificial factors of bacteriological control are: (1) good housekeeping, (2) chlorination (with or without ammonia) of untreated fresh water, (3) chlorination (with or without ammonia) of recirculated white water, and (4) addition of other suitable chemical disinfectants at the beater or elsewhere.

In discussing the inherent factors by means of which bacteriological control has been achieved, the most bactericidal operations in papermaking are the chemical pulping of wood and the bleaching operation. No living organisms are able to survive either process; however, not infrequently the pulps leaving the digester or the bleacher, as the case may be, are quickly contaminated with large numbers of micro-organisms which are present in the wash water. With proper attention to the bacteriological quality of the white water, practically sterile unbleached pulp can be obtained from the pulping operation and sterile chemical pulp can be obtained from the bleaching operation. The lethal effect of heat upon micro-organisms is extremely pronounced in the drier section of the paper machine in which a reduction of 98 to 99% of bacteria is commonly experienced. This point will be discussed at greater length elsewhere in this paper. In some glassine mills it has been observed that the temperature of the stock in the wet system was usually higher than 60° C. It may be interesting to note that the method *(13)* most commonly used for pasteurizing milk requires that the milk be held at 61.8° C. (143° F.) for 30 minutes. In other words the temperature of the stock of these glassine mills is as high or higher than that required for the pasteurization of milk.

The data from mill No. 14 in Table III illustrate the lethal effect of a high temperature in the wet system. The only disinfectant being used in this mill was chlorine which was added to the fresh water. In a few cases the pH of the system has been sufficiently low—i.e., in the neighborhood of 5.0—to exert an inhibitory effect upon bacteria.

Among the artificial means for achieving bacteriological control in a paper mill, one of the most significant is that of good housekeeping. Without this many other conditions, which might otherwise aid in bacteriological control, can be largely nullified. With it, in some cases, very little attention need be given to the use of chemical disinfectants. The use of chlorine (with or without ammonia) for untreated fresh water and for recirculated white water has been established by many mills as the most effective means of bacteriological control through the addition of chemical disinfectants. Chlorine is not only the cheapest disinfectant, but it is usually the most effective one. The use of other commercial chemical disinfectants may supplement the use of chlorine. The latter are particularly important in groundwood mills and in paper mills which use large amounts of groundwood in their furnish. This artificial means of bacteriological control is often very important for slime control and for the protection of woolen felts from decay.

A number of board mills in this country has

TABLE VI.—DIFFERENTIATION OF COLIFORM BACTERIA FOUND IN PAPER MILLS

Mill No.	Date of Surveys	Type of Sample	Frequency of Occurrence: *Aerobacter aerogenes*	Total	*Escherichia coli*	Total	Intermediate Types	Total
A. Specialty Mills								
2	Summer, 1940	Stock	3		3		4	
		White water	2		0		0	
				5		3		4
6	Winter, 1940	Stock	0		1		0	
		Untreated fresh water *	0		2		0	
		Treated fresh water	0		2		0	
				0		5		0
11	Summer, 1940	Stock	3		0		1	
		Untreated fresh water *	0		2		0	
				3		2		1
13	Winter, 1941	Stock	3		3		1	
		Untreated fresh water	0		1		0	
		Treated fresh water	0		1		1	
		White water	1		7		1	
				4		12		3
14	Winter, 1941	Stock	1		0		0	
		Untreated fresh water *	0		3		0	
				1		3		0
B. Board Mills (Sanitary Grades)								
3	Summer, 1940	Stock	2		0		7	
		Untreated fresh water *	0		1		0	
		White water	1		0		4	
				3		1		11
12	Winter, 1941	Stock	11		2		6	
		Untreated fresh water	1		0		1	
		White water	3		2		2	
				15		4		9
C. Board Mills (Nonsanitary Grades)								
3	Summer, 1940	Stock	10		0		12	
		White water	2		0		3	
				12		0		15
12	Winter, 1941	Stock	2		5		3	
		White water	5		2		1	
				7		7		4
Grand Totals				50		37		40

* Untreated fresh water not used within the mill.

pioneered in the field of bacteriological control. They have long since come to the conclusion that bacteriological control pays good dividends in better production and better quality of papers.

Bactericidal Effect of Drier Rolls

The drier rolls have already been mentioned as an important means of bacteriological control in the paper mill, since the reduction in bacterial content of the sheet is usually as much as 98 to 99%. Occasionally certain board mills have experienced inexplicable increases in the bacterial content of the paperboard. In such cases these increases have been sufficient to cause the board to fall below the specifications for use in paper milk containers. A part of the research program at The Institute of Paper Chemistry has been devoted to a study of the lethal effect of drier rolls upon bacteria. This has been done (1) by inoculating the wet web of an experimental fourdrinier machine with known species of bacteria; (2) by determining the bacterial content of peel-off liners from four different types of paperboard, and (3) by determining the heat resistance of five different cultures of spore-forming bacteria *in vitro* and in paperboard. Most of the results *(16)* obtained from these studies were presented at the annual meeting of the Technical Association of the Pulp and Paper Industry in February, 1942.

The bacteriological work on the fourdrinier machine was completed during April, 1942 by studying the effect of the drier rolls upon suspensions of known spore-forming bacteria. A complete picture of the results obtained is given in Table VII. This table includes and supplements the data of the previous publication. The results obtained point clearly to the following: (1) nonspore-forming bacteria (such as *Escherichia coli, Staphylococcus aureus, Serratia marcescens,* and *Aerobacter aerogenes)* can be present in extremely large numbers in the wet web leaving the press section and yet be completely destroyed by passing through the drier section of the paper machine; (2) if correspondingly high concentrations of spore-forming bacteria (such as *Bacillus mycoides, Bacillus mycoides* var,, *Bacillus megatherium, Bacillus megatherium* var., and *Bacillus* sp.) are introduced into the wet web leaving the press section,

TABLE VII.—BACTERIAL CONTENTS OF WET WEB AND FINISHED PAPER

Series	Species of Bacteria Sprayed on the Wet Web	Wet Web * Bacteria per Gram of Dry Fiber	Finished Paper ** Bacteria per Gram of Dry Fiber
1940	No spraying	200,000	485
	Mixed suspension containing:		
	a. *Escherichia coli*		
	b. *Staphylococcus aureus*		
	c. *Serratia marcescens*		
	d. *Bacillus mycoides* var.	8,730,000	2,210,000
	Mixed suspension containing:		
	a. *Escherichia coli*		
	b. *Staphylococcus aureus*		
	c. *Serratia marcescens*		
	d. *Bacillus mycoides*	8,250,000	236,000
1941	No spraying	19,400	1,400
	Escherichia coli	430,000,000	1,350
	No spraying	8,300	930
	Aerobacter aerogenes	257,000,000	880
	Serratia marcescens	238,000,000	1,970
1942	No spraying	46,000	350
	Bacillus mycoides (normal culture)	1,712,000	237,000
	Bacillus mycoides var. (paperboard isolate)	136,500	546,000
	No spraying	320,000	1,300
	Bacillus megatherium (normal culture)	1,031,000	866,000
	Bacillus megatherium var. (paperboard isolate)	936,000	1,198,000
	Bacillus sp. (paperboard isolate)	590,000	90,800

* 31.5% dry fiber.
** 97.0% dry fiber.

a very large number survives the drier section and is found in the finished paper; (3) it appears that when small concentrations of *Bacillus mycoides* and *Bacillus mycoides* var. are introduced into the wet web, they also survive in rather large numbers. On the other hand, small concentrations of each of the other three species of spore-forming bacteria do not seem to survive the drier section.

The bacteriological data obtained from a study of the peel-off liners in a certain board mill have been given in a previous publication *(16)*. In general, large numbers of bacteria were found in both top and bottom liners when these had been made from highly contaminated stock, such as waste paper. The drier rolls did not have sufficient lethal effect to sterilize highly contaminated stock, although it was heated by direct contact with the rolls.

The third approach to the study of the lethal effect of drier rolls upon bacteria was that of determining the heat resistance of various spore-forming bacteria *in vitro* and in paperboard. Data from these studies were also given in a previous publication *(16)*. They point to the following conclusions: (1) spore-forming bacteria, such as *Bacillus mycoides* and *Bacillus megatherium* are capable of surviving a much longer period of exposure to moist heat in paper board than *in vitro* (2) the resistance of these bacteria to heat *in vitro* is often too great for one to expect sterility within the practical time limits used on the drier rolls; (3) the resistance of these bacteria in paperboard is too great to obtain paperboard of bacterial content less than 250 per gram if relatively large numbers of these bacteria are present in the wet web; and (4) the heat resistance of a species of bacteria isolated from paper board may be much greater than that of the normal species.

The above results amply confirm those reported by Tanner, Wheaton, and Ball *(17)* who used, in their experimental work on the lethal effect on drier rolls, *Escherichia coli, Staphylococcus aureus* and an aerobic spore former. They were successful in recovering only the aerobic spore former in the finished paper which proved that the other two test organisms were killed in the drier section. These authors emphasized the fact that *Escherichia coli* was not found in paper and paperboard used for food packaging. The studies conducted by The Institute of Paper Chemistry and by the co-operating paper mills have amply confirmed these findings. Furthermore, the author of this paper has never found coliform bacteria in any paper or board sample, including boards made principally from waste paper.

Thus, it seems clear that some other means of destroying spore-forming bacteria must be used in the mill system if paperboard of low bacterial content must be guaranteed. The lethal effect of the drier rolls is too uncertain and too small to produce the desired result in all cases.

Variation of Bacterial Content in Paperboard Used for Milk Containers

It has already been pointed out that certain board mills have pioneered in the field of bacteriological control. Work along this line, over a period of years, has resulted in the production of paperboard which usually has a very low bacterial content. The bacteriological data actually vary from mill to mill, and, in the case of some mills, it also varies from season to season. In order to illustrate this variation, three board mills have willingly co-operated by submitting

a complete record of bacterial counts which they had obtained over a period of several years.

The bacterial counts made on all the samples taken for this purpose during 1942 have been submitted by Mills A, B, and C. The data for 0.017-inch and 0.030-inch boards made by Mill A have been used to obtain monthly arithmetic averages of bacterial counts, and these results are shown graphically in Fig. 1. They illustrate the effect of the thickness of the board upon its bacterial content. It will be noted that the thicker board shows a consistently lower bacterial content than the other one. In both cases, the bacterial content was higher during the summer months than during the rest of the year. There were 1066 samples having a caliper of 0.017 inch and 257 samples having a caliper of 0.030 inch.

The variation of bacterial content of boards made by Mill B during 1942 is represented graphically in Fig. 2. Here the monthly arithmetic average count was higher during the winter months than during the rest of the year. There were 42 samples, the caliper of which ranged from 0.0125 inch to 0.018 inch. The variation of bacterial content of boards made by Mill C during 1942 is also represented graphically in Fig. 2. The monthly arithmetic average was consistently low throughout the year, with no marked tendency for increased counts either during the summer or during the winter. There were 61 samples, the caliper of which ranged from 0.016 inch to 0.021 inch.

There may be some variation in the bacterial content from one year to the next for the same caliper of board as shown in Fig. 3. In this case there were 1066 samples for 1942 with an arithmetic average of 130 and 757 samples for 1943 with an average of 124. Although the highest counts were obtained from the boards made in the summer, those made in 1943 were considerably lower than those made in 1942.

The above data could be replicated many times, but the same tendency for variation from season to season and from one thickness of board to another

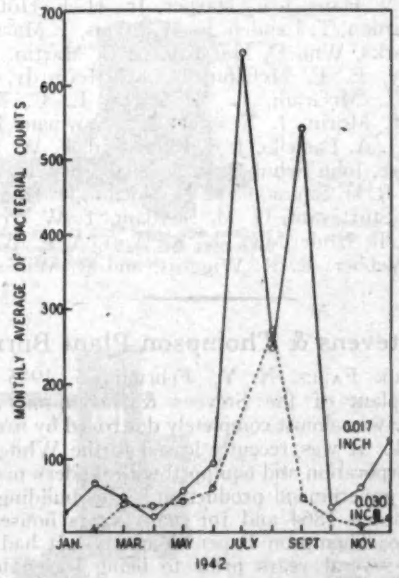

FIG. 1
Variation of Bacterial Content of Board Made by Mill A

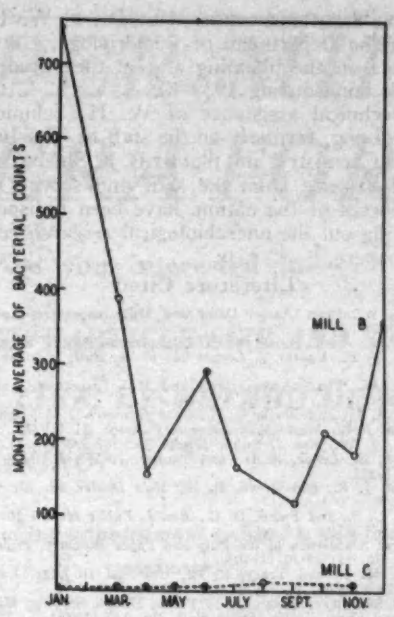

FIG. 2
Variation of Bacterial Content of Board Made by Mills B and C

will be found. The only exception appeared in the case of Mill C, which is located on the West Coast. The other two mills are located on the East Coast. From the results submitted by the respective mills, there can be no doubt concerning the excellent bacteriological control obtained by this western mill.

Acknowledgments

The author gratefully acknowledges the wholehearted co-operation of each mill whose bacteriological data have been used in this paper. Since the Biological Control Committee of the American Paper and Pulp Association and the author agree that complete anonymity of the mills must be preserved, the names of the cooperating mills cannot be given

The author likewise gratefully acknowledges the

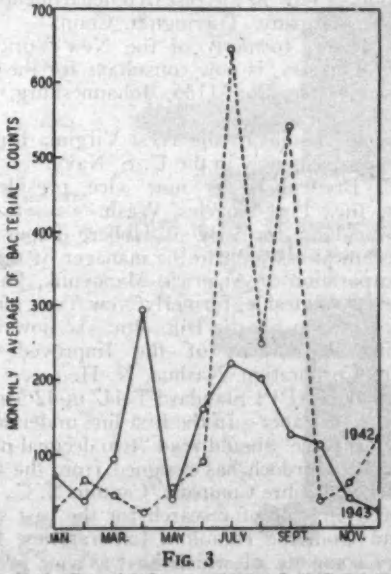

FIG. 3
Variation in the Bacterial Content of 0.017-Inch Board Made by Mill A During 1942-1943

invaluable assistance rendered by Dr. F. W. Tanner, Head of the Department of Bacteriology, University of Illinois, in the planning and in the execution of the work done during 1939-40.

The technical assistance of W. H. Schmidt and R. F. DeLong, formerly on the staff of The Institute of Paper Chemistry, and that of B. F. Shema, now on leave of absence from the staff and serving in the armed forces of the nation, have been indispensable in carrying out the microbiological research reported in this paper.

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TAPPI Notes

Charles Stevens, formerly of the Morrow Manufacturing Company, is now with the Climax Engineering Company, Electronics Division, Clinton, Iowa.

Martin Jaffe, formerly with the National Cellulose Company, is now acting chief chemist for the National Paper Products Company, Carthage, N. Y.

Clayton W. Priest, formerly of the Oswego Falls-Sealright Company, is now chief chemist, Paper Containers Division of the Continental Can Company, 84 Linden Park street, Boston, Mass.

George H. Spencer, formerly of Pusey & Jones Corporation, is now in the research department of the Torrington Company, Torrington, Conn.

W. O. Hisey, formerly of the New York State College of Forestry, is now consultant for the Union Corporation, Ltd., Box 1156, Johannesburg, South Africa.

Berwin B. Thomas of the West Virginia Pulp and Paper Company is now in the U. S. Navy.

W. E. Breitenbach is now vice president of Rayonier, Inc., Port Angeles, Wash.

J. P. Weidner, formerly of Hoberg Paper Mills, is now technical assistant to the manager of the Container Corporation of America, Manayunk, Pa.

Arthur L. Whiteside, formerly New York manager of Black-Clawson-Shartle-Dilts Inc., is now in the engineering department of the Improved Paper Machinery Corporation, Nashua, N. H.

Correction: TAPPI Standard T 447 m-42 Moisture Expansivity of Paper—In the first line under Report, "one decimal place" should read "two decimal places."

Harold R. Murdoch has resigned from the Champion Paper and Fibre Company, Canton, N. C., where he has been director of research for the past sixteen years, and from the Hamilton Laboratories, Inc., a subsidiary company of which he was vice president and general manager. For this company he created and developed the use of certain organic mercurial chemicals (Merfenelopes) as an agent for destroying slime forming organisms in paper mill systems. With his background of 32 years in industrial research, Mr. Murdoch now plans to serve in an advisory capacity to those industries interested in the potentialities of the southeast, as well as to those industries now established in the southern states. He will continue to be located in Asheville, N. C.

Holds Paper Converter's Night

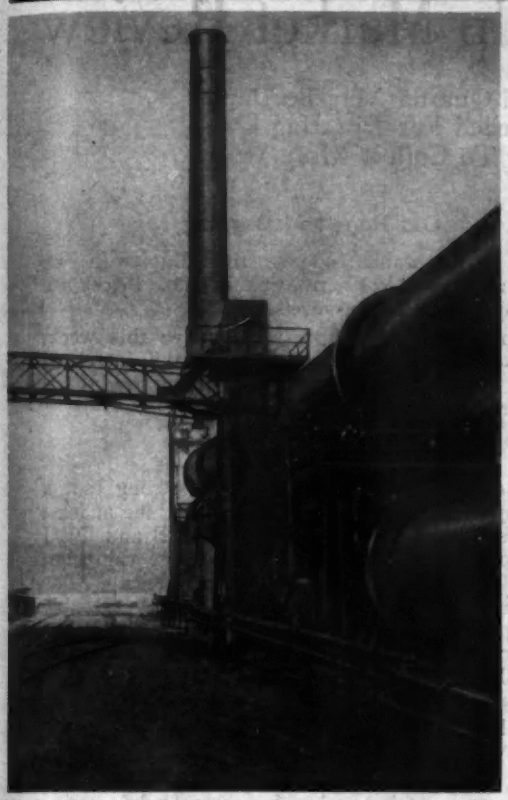
The Delaware Valley Section of the Technical Association extended a special invitation to the box makers, paper merchants, and printers in the local area to hear Mr. R. H. Simmons, Chairman of the TAPPI Graphic Arts Committee, speak on the testing and printing of paper. The meeting was held at the Engineer's Club in Philadelphia on Friday evening, February 2, 1945.

The title of Mr. Simmons' paper was "Paper Testing and Printing" and in it he discussed the relationship of the factors that go into the production of good printing. It was stressed that because paper, as furnished to the printer, is a finished product, it is essential that it embody those characteristics which are required for the particular job at hand. The various properties of paper that are of interest to the printer were discussed and their effect on production and on the finished work noted. Mention was made of the tests commonly used in the specifications for printing papers. It is expected that the paper will be published in full. Questions on specific problems were asked in the discussion which followed the formal presentation.

Those who attended the meeting were as follows: E. J. Albert, A. E. Bartlett, Dorothy A. Beiswinger, R. T. Bingham, A. L. M. Bixler, A. R. Boyd, F. W. Brainerd, K. W. Britt, L. K. Burnett, T. M. Chemerys, Henry Childers, C. M. Connor, O. C. Cordes, Thage Dahlgren, J. C. Dieffenderfer, K. M. Dillabough, W. P. Dohne, J. E. Doyle, Paul Easton, J. M. Farnum, H. J. Farra, Miss M. R. Frame, E. A. Georgi, Jesse Good, M. B. Gormely, R. E. Green, Miss L. V. Hans, J. C. Harper, Jr., H. F. Hoffman, E. R. Kardon, T. Landen, E. M. Lyons, J. Macadam, L. J. Marks, Wm. D. Marshall, G. B. Martin, R. P. McGinley, E. P. McGinn, D. K. McCurdy, Miss Louise E. McGrath, L. B. Miller, E. C. Molin, G. V. N. Morin, I. Newman, L. Newman, E. A. O'Neill, J. A. Paciello, J. E. Plumstead, F. W. Rapp, C. H. Rice, John Schuber, E. A. Shallcross, Jr., C. A. Shubert, R. H. Simmons, E. N. Slocum, H. H. Street, Miss B. Sturtevant, G. M. Suydam, T. W. Toovey, J. Traill, R. Underdown, K. R. Watt, A. E. Waugh, A. H. Webber, R. R. Wiggins, and R. Wilcox.

Old Stevens & Thompson Plant Burned

HOOSICK FALLS, N. Y., February 5, 1945—The former plant of the Stevens & Thompson Paper Company was almost completely destroyed by fire here this week. It was recently leased to the White Flomatic Corporation and equipped with modern machinery for government production. The building was erected about 1864 and for many years housed the Stevens & Thompson Paper Company. It had been idle for several years prior to being leased to the present occupants. Announcement was made that it would be rebuilt as soon as possible.



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WRIGHT-HIBBARD

INDUSTRIAL ELECTRIC TRUCK CO.

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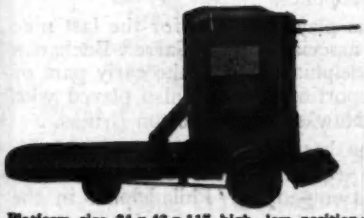
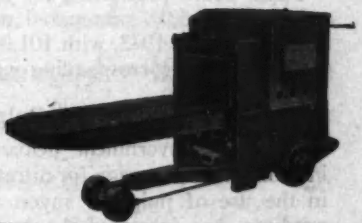
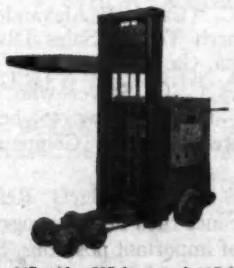


Platform size 24 x 42 x 11" high, low position; 15" high when elevated. Capacity: 2000, 3000, and 4000 pounds.

Capacity 2000 lbs. on forks 30" long. Truck turns from a 5' aisle into an intersecting aisle of 5'.

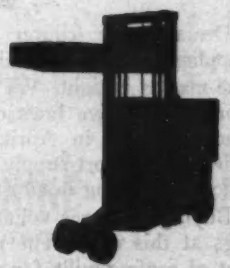


Weight of 4000 lbs. capacity—3850, without battery. Truck turns from a 5' 4" aisle into an intersecting aisle of 4'.



Platform 24" wide, 53" long and 11" high, low position. Capacity 2000, 3000 and 4000 pounds.

The Wright-Hibbard Telescoping high lift truck is designed to operate in the most congested areas of factories and warehouses. The exceptionally narrow width and short overall length found in other Wright-Hibbard trucks are retained in this model.



Platform 24" wide, 42" long and 9" high, low position. Weight of 4000 lb. capacity—3800 without battery.

New York Paper and Pulp Market Review

WPB States Newsprint Quotas In Second Quarter May Be Impossible To Maintain—More Pulp Now Needed For Nitrating Use—WPB and OWI Will Step Up Publicity To Collect More Waste.

Office of the PAPER TRADE JOURNAL,
Wednesday, February 7, 1945.

Wholesale supply for all major types of paper and paper products continues very tight. The trade continues to struggle to effect equitable distribution of an inadequate supply of paper. No change in the serious supply situation appears in sight and all reports reflect the expectation of more serious shortages.

Less newsprint for civilian consumption in the second quarter may occur, the WPB stated in its release on February 3, which said that it might be impossible to maintain present quotas although the Advisory Committee recommended no change in the second quarter. The WPB also stated that all pulpwood products, particularly groundwood, fine, and book papers, are in extremely tight supply. The chief cause is attributed to the increased use of wood pulp for nitrating purposes. Proposals to spread the existing pulp tonnage over a larger amount of newsprint paper, by producing more 30-pound newsprint, are reported and Canadian producers are said to be receptive to the suggestion.

The index of general business activity for the week ended January 27 declined to 146.1, from 147.2 for the previous week, compared with 150.8 for the corresponding week last year. The index of paper board production was 154.1, compared with 152.8 for the preceding week, and with 149.4 for the corresponding week last year.

Paper production for the week ended January 27 was estimated at 88.4%, compared with 89.1% for 1944, with 87.1% for 1943, with 104.3% for 1942, and with 86.1% for the corresponding week in 1941.

Paper board production for the week ended January 27 was 95.0%, compared with 95.0% for 1944, with 88.0% for 1943, with 101.0% for 1942 and with 79.0% for the corresponding week in 1941.

Wood Pulp

Increased government demands for wood pulp, including more tonnage for nitrating use and increases in the use of pulp for rayon and other non-paper products, has increased the serious supply situation which is currently stated to be extremely tight.

Rags

Demand for cotton cuttings continues active. Supplies are reported limited relative to requirements. The market is tight. WPB directives to manufacture more inexpensive lines of shirts and underwear to reach retailers in April, is expected to add some relief to the short supply situation in cotton cuttings. Prices are strong in all grades at ceiling levels.

Buying in larger volume is reported in old cotton rags at this date. The major demand this week is that of roofing mills for old whites. Third and blues are, however, reported more active than for some months. Prices are firm at ceiling levels.

Old Rope and Bagging

Demand for Manila rope is active. Buying in jute and sisal fibers is less active at this date. Prices are generally firm at ceiling levels.

Scrap bagging is a little more active this week. This is attributed in large part to the increased interest of mills in purchasing the roofing grades for inventory. Prices continue nominal.

Old Waste Paper

Mill demand for paper stock is so strong that a tight supply situation is expected to continue at least until the war in Europe ends. The WPB and OWI are stepping up the waste paper salvage campaign with billboard, posters and car card publicity. The Newspaper Committee has prepared a new "Double V Program" to intensify public interest. The Paper Trooper army has now recruited 1,800,000 youngsters in 52,000 schools.

Prices on all grades of paper stock are strong at ceiling levels.

Twine

No important change has been reported in twine this week. Demand is good. Prices are firm.

Goes To Garrett-Buchanan Co.

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., February 5, 1945 — Bert Gardiner, a former hockey player with the Montreal Canadians and Philadelphia Ramblers, has given up this sport to sell the industrial trade Whiz Products and general paper supplies.

Mr. Gardiner has played hockey for the last nine years, but is now associated with Garrett-Buchanan Company of Philadelphia. During the early part of his career in the sporting field, he also played with the Chicago Black Hawks and the Boston Bruins.

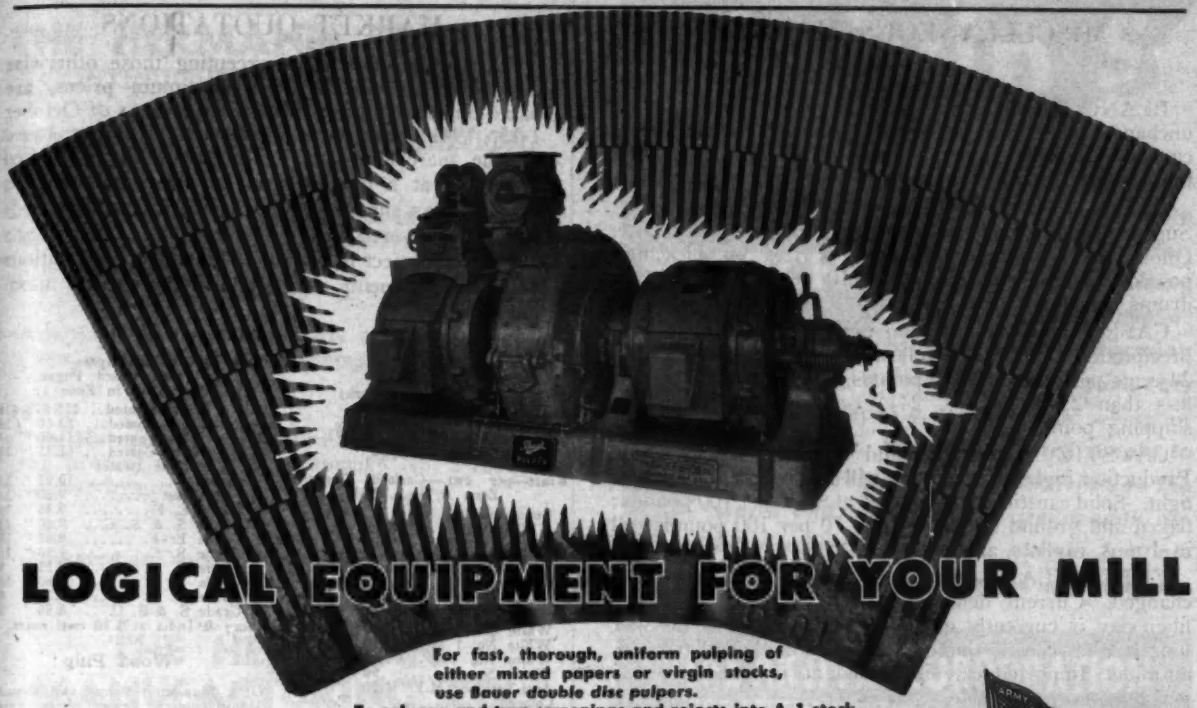
James Hunt, who has been in the paper field for over twenty-five years, is now associated with Garrett-Buchanan Company of Philadelphia in the coarse paper division.

J. C. Alexander Made Div. Mgr.

Corn Products Refining Company today announced the appointment of J. C. (Cantey) Alexander as manager of the Mill Starch Textile Sales Division of the Company at Atlanta, Ga.

Mr. Alexander replaces C. G. Stover who, after many years, is leaving the company to become president of the Monticello Bobbin Company at Monticello, Ga.

Mr. Alexander joined Corn Products Refining Company in July, 1923. Since then he has progressed steadily through a series of important positions. Starting at Greenville, S. C., he was later made manager of the office at Spartanburg, S. C.



LOGICAL EQUIPMENT FOR YOUR MILL

For fast, thorough, uniform pulping of either mixed papers or virgin stocks, use *Bauer double disc pulpers.*

To salvage and turn screenings and rejects into A-1 stock install *Bauer double disc pulpers.*

Two sizes 36" and 24". Plate patterns according to the need.

THE **BAUER BROS.** CO. SPRINGFIELD OHIO

Bauer

West Virginia Pulp and Paper Company

230 Park Ave.
New York

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Chicago

Public Ledger Building
Philadelphia, Pa.

503 Market St.
San Francisco, Cal.

Manufacturers of

ENGLISH FINISH SUPERCALENDERED
MACHINE FINISHED BOOK
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HIGH GRADE COATED BOOK

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KRAFT WRAPPING AND KRAFT ENVELOPE
KRAFT LINER BOARD
BLEACHED SULPHITE AND SODA PULP
BLEACHED AND UNBLEACHED KRAFT PULP

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Tyrone, Pennsylvania
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Charleston, South Carolina

We Are Looking for Trouble

Sometimes small things make lots of trouble. Could your machinery be changed a little to save a lot of work? Write and tell us what we can do to help. Or a *Union* representative will be glad to call.

UNION MACHINE COMPANY

FITCHBURG, MASS.

(Associated with Union Screen Plate Company)

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, February 7, 1945.

BLANC FIXE—Quotations on blanc fixe continue unchanged. Demand is reported moderate. The pulp is currently quoted at $40 per ton, in barrels, at works; the powder is quoted at $60 per ton, f.o.b. works.

BLEACHING POWDER—Current demand is heavy. Supply situation is reported favorable at this date. Quotations continue unchanged. Prices on bleaching powder range from $2.50 to $3.10 per 100 pounds, in drums, car lots, at works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 24 cents per pound; 2,000 pounds, 24¼ cents per pound; less than 2,000 pounds, 24¾ cents per pound, f.o.b. shipping point.

CAUSTIC SODA—Demand continues very heavy. Production high but supply is still inadequate. Market is tight. Solid caustic soda is quoted at $2.30 per 100 pounds; flaked and ground is quoted at $2.70 per 100 pounds; all in drums, car lots, at works.

CHINA CLAY—Quotations on china clay are unchanged. Current demand is reported fair. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mine. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Demand heavy with essential requirements met. Production high. More allocated to pulp mills. Quotations are unchanged. Chlorine is currently quoted at $1.75 per 100 pounds, in single unit tank cars, f.o.b. works.

ROSIN—The rosin market reports prices unchanged on most grades this week. "G" gum rosin is currently quoted at $5.79 per 100 pounds; in barrels, at Savannah. "FF" rosin is currently quoted at $5.75 per 100 pounds, in barrels, at New York. Seventy per cent gum rosin size is currently quoted at $6.06 per 100 pounds, f.o.b. works.

SALT CAKE—Prices on salt cake are reported unchanged for the current week. Consumption is reported moderate for the week. Domestic salt cake is quoted at $15 per ton, in bulk. Chrome salt cake is quoted at $16 per ton. All prices in car lots, f.o.b. shipping point.

SODA ASH—Heavy demand continues for all-over requirements and market is firm. Shipments delayed by weather, and transportation snarl. Quotations continue unchanged. Current prices, car lots, per 100 pounds, are as follows: in bulk, $.90 in paper bags, $1.05; and in barrels, $1.35.

STARCH—Current corn receipts in good volume. Prices reported firm this week. Starch prices continue unchanged. The pearl grade is quoted at $3.72 per 100 pounds; powdered starch at $3.83 per 100 pounds; all prices in bags, car lots f.o.b. Chicago.

SULPHATE OF ALUMINA—Demand reported active. Quotations continue unchanged. The commercial grades are quoted at from $1.15 to $1.25 per 100 pounds, in bags, car lots, f.o.b. works. The iron free is currently quoted at $1.85 per 100 pounds, in bags, at works.

SULPHUR—Quotations on sulphur continue to conform to prevailing market prices. Demand active. Annual contracts are quoted at $16 per long ton, f.o.b. mines; the price at Gulf Ports is $17.50 per long ton.

TALC—Prices on talc continue unchanged. Demand good. Domestic grades are currently quoted at from $16 to $21 per ton at mines; Canadian at $24 per ton. All prices in car lots.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

Standard News, per ton—			
Roll, contract...	*$58.00	@	—
Sheets	66.00	"	—
* OPA Maximum Price.			
Kraft—per cwt.—Carload Quantities Zone A, f.o.b. Mill			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping...	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag.....	*4.375	"	—
* OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1.....	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½....	1.00	"	—
White No. 2.....	.90	"	—
Anti-Tarnish M.F..	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M..	4.16	"	—
Bleached Toilet....	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.....	2.20	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute.....	11.25	@	—
No. 1 Manila Wrapping, 35 lb....	6.00	"	6.25
No. 2 Manila Wrapping, 35 lb.....	5.75	"	6.00
Boards, per ton—			
News	*50.00	@	—
Chip	*50.00	"	—
Sgl. Mla. Ll. Chip	*62.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards...	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.10@$46.00	$40.25@$47.25
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	.... "	29.90 " 35.00
75% Rag	23.00 " 27.00	24.15 " 28.25
65% Rag	.... "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
No. 1..	$10.55@$12.75	$11.70@$14.25
No. 2..	9.65 " 11.75	10.80 " 13.25
No. 3..	9.20 " 11.25	10.35 " 12.50
No. 4..	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper. Delivered in Zone 1:

No. 1 Glossy Coated...	$13.65	@	$13.50
No. 2 Glossy Coated...	12.40	"	14.00
No. 3 Glossy Coated...	11.60	"	13.21
No. 4 Glossy Coated...	11.15	"	12.75
No. 1 Antique (watermarked)	10.25	"	11.75
No. 2 Offset	9.60	"	11.00
A Grade E. F.....	9.35	"	10.75
A Grade S. & S. C...	9.60	"	11.00
B Grade E. F.	8.85	"	10.25
B Grade S. C.	9.10	"	10.50
C Grade E. F.	8.55	"	9.75
C Grade S. C.	8.80	"	10.00
D Grade E. F.	8.25	"	9.50
D Grade S. & S. C...	8.50	"	9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight Not Exceeding OPA Allowances.

Bl. Softwood Sulphite.....	$86.00
Unbl. Softwood Sulphite.....	74.00
Bl. Hardwood Sulphite.....	83.50
Unbl. Hardwood Sulphite.....	71.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich ...72.00 @	82.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate...	82.00
S. Semi Bleached Sulphate...	75.00
N. Unbl. Sulphate.....	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	76.00
Unbl. Soda	72.00
Groundwood	50.00

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area).....	10.50
West Coast (out area).....	16.50

	50%-80% Air Dry Weight
Northeast	11.50
Lake Central	11.50
Southern	14.00
West Coast (in area).....	9.50
West Coast (out area).....	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1..	6.50	@	7.25*
Silesias No. 1.....	—	"	5.75*
New Unbleached...	6.75	"	7.50*
Blue Overall	—	"	5.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

* OPA Maximum Prices.

THE HERMANN CLAFLIN
CONTINUOUS BEATER & REFINER
FOR
ECONOMICAL STOCK PREPARATION

—:—

Numerous installations have proved its ability to improve quality and with a substantial saving in power.

—:—

Adaptable for refining knots and screenings. Continuous and closed systems.

—:—

The Hermann Claflin is built in two sizes at the present time. Large capacity No. 3 ready in near future.

—:—

Operated at Conventional Jordan R.P.M.

—:—

THE HERMANN MANUFACTURING CO.
Also M/g's. Sheet Making-Pulp Testing Apparatus
LANCASTER, OHIO

Aktivin S
LIQUEFIES STARCH

Aktivin S is a stable white powder, a mild oxidizing agent which liquefies starch without forming dextrine and sugar. This means a considerable saving of starch. Aktivin S is very simple to use. Merely add 1% of Aktivin S to the starch and boil with live steam until desired viscosity is obtained. Aktivin S is not an enzyme. Literature and sample upon request.

THE AKTIVIN CORPORATION
393 SEVENTH AVENUE • NEW YORK 1

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ELIMINATES FATS FROM ADHERING AND PLUGGING UP PIPE LINES...

INSTALL the Murray Grease and Wax Interceptor to overcome the problem of collected fatty substances in your pipe or sewer lines . . . now successfully performing in processing plants . . . contents of this interceptor cannot be siphoned into the pipe lines or sewers . . . easy to install . . . requires no attention thereafter . . . easy to clean. Tested and certified on the basis of rigid tests over 90% grease retention. Covered by 3 United States Patents. Let us send you complete details.

D. J. MURRAY MANUFACTURING CO.
WAUSAU MURCO WISCONSIN

PAPER TOWELS

THERE will be more of them used after the war period. • We build highspeed, towel roll winders, interfolders and embossers. Printers and sheeters for your label problems. • Specifications and prices mailed you on request.

HUDSON-SHARP
MACHINE CO • GREEN BAY • WIS

Old Rags

White, No. 1—		
Repacked	*1.80	—
Miscellaneous	*1.20	—
White, No. 2—		
Repacked	*2.90	—
Miscellaneous	*2.65	—
Third and Blues—		
Repacked	*2.20	—
Miscellaneous	*1.80	—
Roofing Rags—		
No. 1	*1.55	—
No. 2	*1.45	—
No. 3 (bagging)	*1.35	—
No. 4	*1.35	—
No. 5A	*1.35	—
Old Manila Rope	5.75	—

OPA Maximum Prices.

Foreign Rags

All Prices nominal

New Rags

New Dark Cuttings	2.25	4.40
New Mixed Cuttings	2.00	2.20
New Light Silesias	5.50	5.75
Light Flannelettes	5.50	5.75
New White Cuttings	7.00	7.50
New Light Oxfords	4.00	4.50
New Light Prints	3.00	3.25

Old Rags

No. 1 White Linens	7.50	8.50
No. 2 White Linens	6.50	7.50
No. 3 White Linens	4.50	—
No. 4 White Linens	2.25	3.25
No. 1 White Cotton	4.25	4.75
No. 2 White Cotton	3.25	3.75
No. 3 White Cotton	2.50	3.00
No. 4 White Cotton	1.90	2.20
Extra Light Prints	2.00	2.40
Ord. Light Prints	1.75	2.15
Med. Light Prints	1.55	1.95
Dutch Blue Cottons	2.25	2.50
French Blue Linens	3.00	—
Checks and Blues	2.00	—
Linsey Garments	1.90	2.00
Dark Cottons	1.50	1.60
Old Shopperies	1.30	1.45
New Shopperies	1.45	1.50
French Blues	2.25	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—		
Foreign	Nominal	
Domestic	4.25	4.35
Wool Tares, light	4.25	4.50
Wool Tares heavy	4.50	5.00
Bright Bagging	4.50	4.85
Manila Rope—		
Foreign	—	—
Domestic	*5.75	—
Jute Threads	5.50	—
No. 1 Sisal Strings	*4.00	—
Mixed Strings	2.00	—

*OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	—
No. 1 Hard White Envelope Cuts	3.12½	—
No. 1 Hard White Shavings, unruled	2.87½	—
No. 1 Hard White Shavings, ruled	2.50	—
Soft White Shavings, one cut	2.87½	—
No. 1 Soft White Shavings	2.50	—
Soft White Shavings, Misc.	2.15	—
No. 1 Fly Leaf Shavings	1.67½	—
No. 2 Fly Leaf Shavings	1.12½	—
No. 1 Groundwood Fly Leaf Shavings	1.25	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	—
Mixed Colored Shavings	.75	—
Mixed Groundwood Colored Shavings	.90	—
Overissue Magazines	1.67½	—
No. 1 Heavy Books & Magazines	1.92½	—
Mixed Books	1.10	—
No. 1 White Ledger	2.30	—
No. 2 Mixed Ledger, colored	2.00	—
New Manila Envelope Cuttings, one cut	2.87½	—
New Manila Envelope Cuttings	2.65	—
Extra Manilas	1.95	—
Mixed Kraft, Env. & Bag Cuttings	2.75	—
Kraft Envelope Cuttings	1.25	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	—
New 100% Kraft Corrugated Cuttings	2.25	—
No. 1 Assorted Old Kraft	1.75	—
New Jute Corrugated Cuttings	.90	—
Old 100% Kraft Corrugated Containers	1.75	—
Old Corrugated Containers	1.40	—
Box Board Cuttings	.72½	—
White Blank News	1.65	—
Overissue News	1.10	—
No. 1 News	1.00	—
No. 1 Mixed Paper	.95	—
Old Corrugated Containers	.82½	—
Mill Wrappers	1.10	—

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—		
India	.21	—
White Hemp	.21	—
Fine Polished—		
Fine India	36	—
Unpolished—		
Box	17½	—
Paper Makers	.17	—
Tube Rope	.19	—
Wall Paper	.20½	—
Wrapping	.23	—
Soft Fiber Rope	.19	—
Cotton	.23	—

(Hard Fiber)

Medium Java	.13	—
Mex. Sisal	.16	—
Manila	-	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill.)

Shirt Cuttings—	
New White No. 1	.07¾
New White No. 2	.05¾
Light Silesias	.05¾
Black Silesias, soft	.03¾
New Unbleached	.07½
Washable Prints	.04¾
Washable No. 1	.03
Blue Overall	.05½
Cottons—According to grades—	
Washable shredding	.01¾
Fancy Percales	.04¾
New Black Soft	.03¾
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04¾
Men's Corduroy	.02½
Ladies' Corduroy	.01
Cottonades	.03¾

Domestic Rags (Old)

White No. 1—Repacked	1.85	—
Miscellaneous No. 1	1.20	—
Miscellaneous No. 2	2.45	—
White No. 2—Repacked	2.90	—
Thirds and Blues—		
Miscellaneous	1.80	—
Repacked	2.20	—
Black Stockings—		
(Export)	Nominal	
Roofing Stock—		
Foreign No. 1	Nominal	
Domestic No. 1	1.55	—
Domestic No. 2	1.45	—
Roofing Bagging	1.35	—
Old Manila Rope	5.75	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—		
Foreign	Nominal	
Domestic	3.00	3.50
No. 1 Clean bright—		
Sisal Strings		.04
No. 2 Clean bright—		
Sisal Strings		.03
Sisal Jute	.02½	.02¾
Scrap—		
No. 1	1.25	1.50
No. 2	1.75	1.90
Wool Tares ban	4.00	4.75
No. 1 New Lugs Burlap	3.00	4.00
New Burlap Cuttings	3.75	4.00

Old Papers

(F. o. b. Phila)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	—
No. 1 Hard White Shavings, unruled	2.87½	—
Soft White Shavings, one cut	2.50	—
White Blank News	1.65	—
Soft White Shavings		
No. 1 White Ledger	2.30	—
No. 2 Ledger, colored	2.00	—
No. 1 Heavy Books & Magazines	1.92½	—
Overissue Magazines	1.67½	—
New Manila Envelope Cuttings	2.65	—
No. 1 Assorted Old Kraft	1.75	—
No. 1 Mixed Paper	.95	—
Box Board Cuttings	.72½	—
Kraft Corrugated Cuttings	2.25	—
Old Corrugated Containers	1.40	—
Overissue News	1.00	—
No. 1 News	1.00	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices, Baled

No. 1 Hard White Shavings, unruled	2.87½	—
No. 1 Hard White Shavings, ruled	2.50	—
Soft White Shavings, Misc.	2.15	—
No. 1 Fly Leaf Shavings	1.67½	—
No. 2 Fly Leaf Shavings	1.12½	—
No. 1 Groundwood Fly Leaf Shavings	1.25	—
No. 2 Groundwood Fly Leaf Shavings	.90	—
Mixed Colored Shavings	.75	—
New Manila Envelope Cuts, one cut	2.87½	—
Hard White Envelope Cuts, one cut	3.37½	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	—
Mixed Kraft Env. & Bag Cuttings	2.75	—
Kraft Envelope Cuttings	3.25	—
No. 1 Heavy Books & Magazines	1.92½	—
New Manila Envelope Cuts, one cut	2.87½	—
New Manila Envelope Cuttings	2.65	—
White and Colored Tabulating Cards	2.25	—
Ground Wood Tabulating Cards	1.35	—
White Blank News	1.65	—
No. 1 Assorted Old Kraft	1.75	—
No. 1 Mixed Paper	.95	—
Overissue News	1.10	—
Box Board Cuttings	.72½	—
New Corrugated Cuttings, Kraft	2.25	—
Old 100% Kraft Corrugated Containers	1.75	—
Old Corrugated Containers	1.40	—
Jute Corrugated Cuttings	1.07½	—

Bagging

(F. o. b. Boston)

Gunny Bagging—		
Foreign	(nominal)	
Domestic	—	2.50
Sisal Rope No. 1	*4.75	—
Sisal Rope No. 2	*4.25	—
Mixed Rope	—	1.55
Transmission Rope—		
Foreign	(nominal)	
Domestic	2.75	3.00
Manila Rope—		
Foreign	(nominal)	
Domestic	5.75	—
Soft Jute Rope	5.25	—
Jute Car Threads	3.00	3.50
Bleachery Burlap	8.50	9.00
Scrap Burlap—		
Foreign	(nominal)	
Domestic	—	2.75
South American	—	3.00

Wool Tares—		
Foreign	(nominal)	
Domestic	4.25	—
Aust. Wool Pouches	—	3.00
New Zealand Wool Pouches	—	3.50
New Burlap Cuttings	4.75	5.00
Heavy Baling Bagging	4.00	4.25
Paper Mill Bagging	2.50	3.00
No. 2 Roofing Bagging	1.35	—

*OPA Maximum Price.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—		
New Light Prints	.04½	.04½
Fancy Percales	.04¼	.04½
New White No 1	.06¼	.07
New Light Flannelettes	.05½	.06
Canton Flannels, Bleached	.06	.06½
Underwear Cutters, Bleached	.06¼	.06½
Underwear Cutters, Unbleached	.05¼	.06
Silesias No. 1	.06	.06½
New Black Silesias	.03	.03½
Red Cotton Cuttings	.03½	.04
Soft Unbleached	.06½	.06½
Blue Cheviots	.05½	.06
Fancy	.02¾	—
Washable	.02¾	—
Khaki Cuttings	.02¾	.03
O. D. Khaki	.03½	.03½
Corduroy	.03¼	.03¾
New Canvas	.06¼	.06½
B. V. D. Cuttings	.06¼	.06½

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—		
Repacked	3.80	—
Miscellaneous	3.20	—
White No. 2—		
Miscellaneous	2.65	—
Twos and Blues, Repacked	2.20	—
Old Blue Overalls	2.25	2.50
Thirds and Blues, Repacked	2.20	—
Miscellaneous	1.80	—
Black Stockings	3.50	4.00
Roofing Stock—		
No. 1	1.55	—
No. 2	1.45	—
No. 3	1.35	—
No. 4	1.35	—
No. 5, Quality A	1.35	—
Quality B	1.20	—
Quality C	.95	—
Old Manila Rope	5.75	—

*OPA Maximum Prices.

Foreign Rags

(F. o. b Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices, Baled

Shavings—		
No. 1 Hard White Envelope Cuts, one cut	3.37½	—
No. 1 Hard White Shavings, unruled	2.87½	—
No. 1 Soft White Shavings	2.50	—
No. 1 White Ledger	2.30	—
No. 1 Heavy Books & Magazines	1.92½	—
White Blank News	1.65	—
Mixed Kraft Env. & Bag Cuttings	2.75	—
No. 1 Assorted Old Kraft	1.75	—
Overissue News	1.10	—
No. 1 News	1.00	—
No. 1 Mixed Paper	.95	—
No. 1 Roofing Rags	1.55	—
No. 1 Roofing Bags	1.45	—

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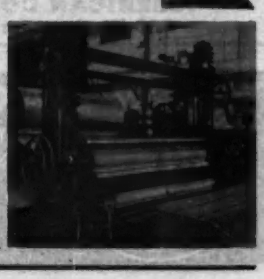

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Mfrs. of Engraved Embossing Rollers and Plates of Any Type and Description
Worn Rollers Re-Engraved.
Complete Designing and Engineering Service

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For High-Speed, Dependable
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MADE SPECIALLY FOR PAPER and PULP MILL USE
Copper, Bronze, Steel, Stainless Steel and other metals, Heat-treated.
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PAPER TRADE JOURNAL
ANNUAL REVIEW NUMBER
February 22, 1945

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Active Paper Export House with world wide connections has position open for energetic man with knowledge paper trade and executive ability. Box 45-65 care Paper Trade Journal. F-8

WANTED

Partner with paper making experience for mill now in successful operation. Address Box 45-62, Paper Trade Journal. F-22

WANTED—MASTER MECHANIC

Paper mill in Northern New York State, manufacturing toilet and facial tissue, has position open as Master Mechanic. Experience on Yankee Fourdrinier Machines and roll toilet paper converting equipment necessary. Should have knowledge of engineering. Excellent future for a good man. Please furnish complete job qualifications. Address Box 45-60 care Paper Trade Journal. F-15

"The Research Department of a large fibre container manufacturer has an opening for a chemist or chemical engineer, preferably with paper or paperboard mill experience. Work includes assistance in the development, manufacture, and quality control of paper packages. Midwest location. State education, experience, references, draft status, and salary expectations. Address Box 45-63, care Paper Trade Journal." F-22

SALARIED POSITIONS — This advertising service of 35 years' recognized standing negotiates for high salaried supervisory, technical and executive positions. Procedure will be individualized to your personal requirements and will not conflict with Manpower Commission. Retaining fee protected by refund provision. Identity covered and present position protected. Send for details. R. W. BIXBY, INC., 117 Delward Bldg., Buffalo, 2, N. Y. ti

ENGINEERING DRAFTSMAN for Post War Design and Development Paper Mill Machinery. Experience in Paper Mill Equipment Design Helpful. Location Northern New Jersey. State experience. Certificate availability necessary. Write Box 44-527, Paper Trade Journal, 15 West 47th St., New York, 19. N. Y. TF

URGENTLY NEED MACHINE TENDERS AND BACK TENDERS FOR PAPERBOARD MILL. MARVELOUS FUTURE IN THE PACIFIC NORTHWEST. ADDRESS BOX 45-45 care Paper Trade Journal. F-8

WANTED—Machine Tender. High speed fourdrinier machine manufacturing Kraft paper. Prefer man with high school or better education—25 or 35 years of age. Any applicants regarding this position must comply with WMC regulations. Address Box 45-36 care Paper Trade Journal. TF

DESIGNING engineers, draftsmen, resident engineer, general industrial pulp and paper experience, desired by well established firm of consulting engineers. Address Box 45-51 care Paper Trade Journal. F-15

HELP WANTED

CHARLES P. RAYMOND SERVICE, Inc.
294 Washington St., Boston, Mass.
Specializing in Paper Mill Personnel
Positions Now Open

Manager light weight paper mill
Manager converting plant, light weight papers
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Mechanical, plant, industrial and time study engineers
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Chemists
Machine and back tenders, beater engineers, all round mechanic and many others.

We invite correspondence (strictly confidential) with employers seeking personnel and men seeking new positions. F-8

MASTER MECHANIC—Excellent opportunity for qualified man to take charge of maintenance in large folding paper box plant. Address Box 45-66 care Paper Trade Journal. F-15

PURCHASING AGENT—Age 30 to 40. Volume purchasing experience necessary. Post war opportunity. Give complete resume and salary desired. Address Box 45-79 care Paper Trade Journal. F-22

SUPERINTENDENT—Experienced, Self Opening, Squares, Flats, Sacks, Specialties. To take full charge of Bag Plant. Give full data. Address Box 45-76 care Paper Trade Journal. F-15

SUPERINTENDENT Fine Paper Mill New England. Address Box 45-75 care Paper Trade Journal. F-8

PAPER BAG MACHINE ADJUSTERS — Modern plant in Philadelphia. All new equipment. Ideal working conditions. Give full details of experience in first letter. Address Box 45-72 care Paper Trade Journal. F-15

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CHEMICAL ENGINEER for pilot plant operation and process development research. Permanent position and good postwar future with established organization in Lake States region. Knowledge of fermentation biochemistry advantageous. Send full details and photo in first letter. WMC rules apply. Address Box 45-82 care Paper Trade Journal. F-8

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PRODUCTION MAN—Thoroughly experienced in production and supervision all varieties fine cardboards. Successful record personnel relations. Address Box 45-4 care Paper Trade Journal. F-22

PRACTICAL MANAGER or Superintendent—25 years experience on Book, Bond, Writing, Litho, Offset, Kraft, Board and ground wood specialties. Wishes to make change. Take complete charge of mill. Go anywhere. Address Box 45-34 care Paper Trade Journal. F-8

WANTED—Position as Plant Engineer in large mill or group. Technical education, 25 years experience, proven ability in design, construction and maintenance of mechanical, electrical and power equipment in board mills and box shops. Successful in managing labor, best of references. Now employed. Address Box 45-40 care Paper Trade Journal. F-8

AVAILABLE — GLASSINE AND GREASEPROOF SUPERINTENDENT. Twenty-eight years of practical and successful experience. References. Age 46. Married. Address Box 45-35 care Paper Trade Journal. F-8

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FOR SALE

1—Trimbey Thickener—36" diameter x 93" face Cylinder Mould.

2—#5 Bird Save-alls.

1—Trimbey Centrifugal Pulp Screen.

1—120" Fourdrinier Wet End.

1—68" Drilled Face Suction Press Roll.

2—Packer Type 14 plate Flat Screens—with Witham Fasteners and scraping devices—plates .022 cut.

1—#9 Emerson Jordan for direct connection to a motor, requires use of 400 H.P. motor.

1—Shartle Brothers Duplex 10 x 20 Stock Pump.

1—Moore & White 10 x 12 Triplex Stock Pump.

2—2000 lb. Holyoke Beaters.

1—1800 lb. Dayton-Globe Beater.

1—1200 lb. Stout, Mill & Temple Beater.

1—1200 lb. Dayton-Globe Iron Tub Beater.

2—Jones pulpers—direct connected to 60 H.P. motors.

18—Dryers — 36" diameter x 94" face — complete with two deck frames, etc.

1—Buffalo Pump — 5500 g. p. m., direct connected to 100 H.P. Motor (50' head).

1—60" Kidder Slitter & Winder.

1—#4 Roots-Connersville Vacuum Pump.

Various sizes of Centrifugal Pumps. Write us regarding your particular requirements.

We are always in the market to purchase your surplus or idle machinery. What have you to offer?

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Newark 5, N. J.
Bigelow 3-3720 F-8

Franklin did and got a spark. A New York mill also tried it and got a whole volt—a bright idea—a money saving idea.

THIS IS WHAT HAPPENED

The Oswego Falls Corpn., home of the famous "Seabright" brand, were trucking waste to the dump and burning it—one man's time, a truck's time, and a fire hazard to boot. Cost $200 to $300 per month and every cent wasted. Not only that, they compounded the "felony" because they were also wasting 50 to 60 tons of $45.00 stock per month. Total yearly loss in time, truck and stock? Figure that for yourself.

That was yesterday. Today a small *hydrapulper (4')* salvages all the good stock and only cellophane and other foreign material goes to the dump.

Yes, sir! Kite flying pays. And, since there's no ceiling on savings—Go Fly a Kite!

Investigate the hydrapulper—now.

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Shartle Bros. Machine Co., Middletown, Ohio
Div. of Black-Clawson Co., Hamilton, Ohio

SITUATIONS WANTED

SULPHITE SUPERINTENDENT or ASSISTANT available soon. Chemical Engineering Graduate. Address Box 45-50 care Paper Trade Journal. F-8

BEATER ROOM FOREMAN—Fine papers. Expert on colors. Eleven years assistant superintendent prominent rag bond mill. Understands his work thoroughly. Superintendent timber. Expects good salary. Available immediately. Address Box 45-55 care Paper Trade Journal. F-8

SUPERINTENDENT or assistant superintendent. Rag bonds and ledgers. Outstanding ability both machines and beaters. Expert on colors. Many years with leading manufacturer. Excellent references. Address Box 45-56 care Paper Trade Journal. F-8

PRACTICAL SUPERINTENDENT on high grade folding boards, sulphite and groundwood specialties, test liner, etc. Address Box 45-59 care Paper Trade Journal. F-15

MILL REPRESENTATIVE—Fine or coarse papers. Excellent background, long experience. Capable of complete charge sales office or opening new area. Preferably New York. Address Box 45-58 care Paper Trade Journal. F-8

POSITION WANTED—Tour Boss or Night Superintendent. Well up on folding grades. Can report at once. Address Box 45-80 care Paper Trade Journal. F-15

KRAFT PULP MILL SUPERINTENDENT and Kraft Paper Mill Superintendent desires positions in modern kraft mill. Both men thoroughly experienced in the manufactory of Kraft Pulp and Kraft Paper. Have worked successfully together for the past four years. Both men in their late thirties. All replies held strictly confidential. Address Box 45-78 care Paper Trade Journal. F-22

TOUR FOREMAN desires change. Experience on Cylinders or Fourdrinier Machines. Will consider job as machine tender. Experience on most all grades of paper and box board. Can handle help and get production. Will give good references. Address Box 45-74 care Paper Trade Journal. F-15

ASSISTANT MANAGER of Large Paper Firm Desires Change. Good Background, Executive Ability. Address Box 45-83 care Paper Trade Journal. F-22

FOR SALE

FOR SALE

Running Board and Specialty Mill.—20 ton capacity—located in East. Address Box 45-61 care Paper Trade Journal. F-22

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Guaranteed used steel pipe and boiler tubes
Wood and steel tanks
Buildings, valves and fittings

JOS. GREENSPON'S SON PIPE CORP.
Natl. Stock Yards, St. Clair Co., Ill. M-8

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FOR SALE

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Waverly 3-5675

2—120" Hamblet Duplex Sheeters with slitting device and Hamblet Layboys. Will stack four piles. With two deck 12 roll backstands.
These machines are in excellent condition and are guaranteed for 60 days. Prints on request.
1—Pusey & Jones 6" x 8" open impeller Centrifugal Stock Pump. Belt driven.
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4—14" x 20" Connersville Vacuum Pumps.
3—12" x 18" Connersville Vacuum Pumps.
These pumps are fully rebuilt.
5—New Fourdriniers, wires 75 mesh, 75" wide by 50 foot long. Now in original boxes.
1—Downingtown 2500 lb. iron tub cyclone beater. Beater roll 60" face, 72" diameter. This beater in excellent condition having been in operation less than two years. Prints on request.

F-8

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(Guaranteed)

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50 HP GE Type-I Form-K 900RPM 440V. $350.00
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10 HP Century Type-RS 3600-RPM 110/220V. $175.00
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65" Hamblet Sheeter with 4 slitters—with or without 6-roll backstand.
110" Hamblet Sheeter with 3 slitters and 4-roll backstand.
45" White Automatic Power Cutter.
68" Rice Barton & Fales Slitter & Rewinder, for use on dry end of paper machine.
63" Oswego Mill Type Cutter.

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TF

Plymouth and Milwaukee gas locomotives, 8, 12, 25 tons, 36" & standard gauge, A-1.
Davenport, Porter, Vulcan 17 to 19-ton steam 36" gauge S/T locomotives, (4), rebuilt, tested.
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American steam railway ditcher-crane, 28' boom.
Draglines — Shovels — Crawler Wagons.

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Milwaukee 2, Wis. F-8

FOR SALE—44" Seybold Cutter, guaranteed to be in good operating condition. Address Box 45-81 care Paper Trade Journal. F-8

FOR SALE

296 Heat-treated Flybars for Jones 2000# beaters for 67 dia. 89 inch face rolls, 6" wide ⅝" cutting edge, ⅜" back edge punched for 2 bands 2" wide 1" thick.
140 Heat-treated Flybars for Jones bandless rolls 60" long, ⅝" cutting edge.
1—Set Jones wood filling for roll 67 dia., 60" face, 70 bars banded type.
1—Complete set ½" steel filling for Jones Majestic Jordan plug, 3-part type.
1 Assembled shell filling for Noble & Wood Mammoth Jr. Jordan.

All above are new stock never uncrated and are offered considerably under replacement price and are ready for shipment.

OSBORNE PAPER MILL EQUIPMENT CO.
Fulton, N. Y.
F-8

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1—Complete 98" Fourdrinier Paper Machine with 26 Dryers, 48" diameter x 96" face, including auxiliary equipment. Additional details on request.

J. J. ROSS COMPANY
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Telephone Bigelow 3-3720

FOR SALE

1—25 Ton Industrial Steam Locomotive Crane with 42' Boom. 8 wheel standard gauge trucks and steel side frames. Completely rebuilt. Available for immediate shipment.
1—54" CODE Locomotive Crane Boiler. Completely overhauled. Will fit any Crane. Immediately available.

HAWKINS & COMPANY
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FOR SALE—Sixty (60) Dryers consisting principally of 86" and 90" face, a few 84" and 85" face, complete with triple deck stands, gears, bearings and piping. Empire Box Corporation, Garfield, New Jersey. F-15

FOR SALE

FOR SALE—1 Hamilton-Corliss Variable Speed Twin Engine, size of cylinders 12" x 24". Also Triple-Deck Frames for ninety 36" dryers, any width. The Chesapeake Paperboard Co., Baltimore, 30, Md. TF

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FOR SALE—Unused clothing suitable for 48" and 76" Fourdrinier Paper Machines, includes wires, felts, aprons and jackets. Address Box 45-71 care Paper Trade Journal. F-15

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FOR SALE—Standard 45" Beck Rotary Sheet Cutter, complete with jogger table and four roll backstand. Rebuilt and Guaranteed. For further particulars address Box 45-85 care Paper Trade Journal. F-8

WANTED

WANTED

CALENDER STOCK—10" INTERMEDIATE ROLL MINIMUM
ALSO
SHEETER—SINGLE OR DOUBLE CUT-OFF BOTH FOR 72" MACHINE

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WANTED TO BUY—One Yankee Dryer, approximately 84" in width, from 84 to 120" in diameter. Address Box 45-64 care Paper Trade Journal. F-22

WANTED

WANTED

One Beater of 1,000 lb. capacity.

One Jordan—No. 1 or No. 2 Miami or equivalent.

Two Calender Stacks — Approximately 100 inch face.

Give complete description, specifications and price.

Empire Box Corporation
Garfield, New Jersey
TF

WANTED

One (1) Laboratory Beater
Waterbury Hydraulic Drive size 5
11—60" Diameter x 92" Face Dryers
16—48" Diameter x 92" Face Dryers
4—36" Diameter x 92" Face Dryers

with gears, frames, felt rolls and cone pulley drives. Address Box 44-768 care Paper Trade Journal. TF

WANTED

WANTED

Complete—small paper mill. Trim 40 to 72". Write fully what you may have to offer.

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WANTED — DISCARDED PAPER MILL FELTS. HIGHEST PRICES paid for all kinds of discarded paper mill felts. LARGE or SMALL QUANTITIES accepted. Prices quoted immediately on receipt of samples. ADDRESS: GLASER AND YOFFE, INC., 80 NORTH MAIN ST., NATICK, MASS. TF

WANTED—W & P Shredders, Evaporators, Generators and Boilers, Slitters, Cutters, Hydraulic Presses, Sheridan Presses, Dryers. Address Box 44-835 care Paper Trade Journal. tf

WANTED—Brightwood Box Machine. Address Box 44-836 care Paper Trade Journal. tf

WANTED—Any Item of Paper Tube and Paper Can Machinery, Slitters, Tube Winders, Cutters, etc. etc. We will buy such machinery in any condition. Theo. Adams, 111 W. Washington St., Chicago, 2, Ill. TF

WANTED — Three CARRIER DELIVERY units larger sizes preferred such as used on grocery bag machines. Address Box 45-65 care Paper Trade Journal. F-8

WANTED to Purchase Outright—ANILINE PRESS DESIGN—Drawings, etc. Require type of press to be used in conjunction or in tandem with grocery or specialty bag machines. Submit photographs, general specifications, and advise approximate price and terms. Address Box 45-77 care Paper Trade Journal. F-15

68th ANNUAL REVIEW NUMBER

OF

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FEBRUARY 22nd 1945

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Weber, Herman G.

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J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
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Black-Clawson Company
Murray, D. J. Mfg. Co.
Ross Engineering Corp., J. O.

CORES
Elizman Paper Co.
Sonoco Products Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Smith & Winchester Mfg. Co.
Walker-Goulard-Plohn Co.

COUPLINGS
Black-Clawson Company
De Laval Steam Turbine Co.
Farrel-Birmingham Co., Inc.
The Frederick Iron & Steel
E. D. Jones & Sons Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works
Waldron Corp., John
Westinghouse Electric Mfg. Co.
T. B. Wood's Sons Company

CUTTERS
Thomas W. Hall Co.
Noble & Wood Mach. Co.
Perkins & Son, Inc., B. F.
The Smith & Winchester Mfg. Co.
Taylor Stiles & Co.

DAMPENERS
Perkins & Son, Inc., B. F.
Valley Iron Works Co.

DE-INKING
Kinsley Chemical Co.

DIGESTERS
The Bigge Boiler Works Co.
H. K. Porter Company Inc.
Pusey & Jones Corp.

DOCTORS
Bird Machine Company
Black-Clawson Company
Downingtown Mfg. Co.
Lobdell Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DOCTOR BLADES
Black-Clawson Company
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Simonds Worden White Co.
Shartle Brothers
United States Rubber Co.
Westinghouse Electric & Manufacturing Company

DRIERS
Black-Clawson Company
Murray Mfg. Co., D. J.
J. J. Ross Company
Ross, J. O. Engineering Corp.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

DRIVES
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Bird Machine Co.
Black-Clawson Company
Davis, Frank H., Co.
De Laval Steam Turbine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
General Electric Company
Horton Manufacturing Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Moore & White Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
T. B. Wood's Sons Co.
Valley Iron Works Co.
Westinghouse Electric & Manufacturing Company

DUSTERS
Appleton Machine Co.
Downingtown Mfg. Co.
E. D. Jones & Son Co.
Moore & White Co.
Noble & Wood Machine Co.
Norwood Engrg. Co.
D. J. Murray Mfg. Co.

DYESTUFFS
Calco Chemical Co.
Ciba Company
E. I. du Pont de Nemours & Co.
Geigy Co., The
General Dyestuff Corp.
National Aniline Division, Allied Chemical & Dye Corp.
Paper Makers Chemical Department, Hercules Powder Co.
C. K. Williams & Co.
Witco Chemical Co.

EVAPORATORS
Black-Clawson Company
Goslin-Birmingham Mfg. Co., Inc.
Murray, D. J., Mfg. Co.
Traylor Engineering & Mfg. Co.

FANS
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.

FEEDERS
Merrick Scale Mfg. Co.
Leeds & Northrup
Traylor Engineering Co.
Wallace & Tiernan

FELTS
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Bloomfield Woolen Co.
Bulkley, Dunton Pulp Co. Inc.
Draper Bros. Corp.
Pitchburg Duck Mills
Huyck & Son, F. C.
Lockport Felt Co.
Mt. Vernon-Woodbury Mills, Inc.
Morey Paper Mill Supply Co.
Orr Felt & Blanket Co.
Shuler & Benninghofen
Waterbury Felt Co.
Woodward, Baldwin & Co.

FELT GUIDES
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

FILLERS
American Colloid Co.
Amer. Cyanamid & Chem. Corp.
International Pulp Co.
W. H. Loomis Talc Corp.
Union Talc Co.
Vanderbilt Co., R. T.
Witco Chemical Co.

FILTERS
Moore & White Co.
J. O. Ross Engrg. Corp.
Worthington Pump & Mchy. Corp.
Witco Chemical Co.

FLOORING, GRATING & TREADS
Hendrick Mfg. Co.
Klemp, W. F., Co.
Norton Co.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
Robinson, C. P.
United States Rubber Co.

FORMING MACHINES
Downingtown Mfg. Co.
Noble & Wood Machine Co.
Oliver United Filters
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

WHERE TO BUY

GEARS
Black-Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

GRINDERS
Cavel-Hanchett Co.
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Montague Machine Co.
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Simonds Worden White Co.
United States Rubber Co.

HEATING, VENTILATING AND AIR CONDITIONING
The Appleton Machine Co.
Armstrong Machine Works
E. D. Jones & Sons Co.
General Electric Co.
Grinnell Company
Leeds & Northrup
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Ross Engineering Corp., J. O.
Shartle Brothers Machine Co.
Valley Iron Works Co.
Worthington Pump & Mchy Corp.

HOISTS
Appleton Machine Co.
Ditts Machine Works
Rodney Hunt Machine Co.
Ingersoll-Rand Co.
E. D. Jones & Sons Co.

HOSE (Air, Water, Suction, etc.)
The Cincinnati Rubber Mfg. Co.
The Manhattan Rubber Manufacturing Division of Raybestos-Manhattan Inc.
United States Rubber Co.

INSTRUMENTS, TESTING AND MEASURING
W. H. & L. D. Betz
M. P. Bowsher
The Foxboro Company
General Electric
W. & L. E. Gurley
Leeds & Northrup Company
National Technical Laboratories
B. F. Perkins & Son
Taylor Instrument Cos.
Wallace & Tiernan Co., Inc.
Westinghouse Electric & Manufacturing Company
Wilkens-Anderson Co.

JORDAN FILLINGS
Appleton Machine Co.
Behr Brothers Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KNIVES
Black-Clawson Company
Ditts Machine Works, Inc.
Hamblet Machine Co.
E. D. Jones & Sons Co.
Simonds Worden White Co.
Valley Iron Works Co.

LABORATORY EQUIPMENT
Appleton Machine Co.
W. H. & L. D. Betz
Ditts Machine Works
E. D. Jones & Sons Co.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Taber Instrument Co.
Taylor Instrument Companies
Valley Iron Works Co.

LAY BOYS
Hamblet Machine Co.
Moore & White Co.
Shartle Brothers

LUBRICANTS
Gulf Oil Corporation
Gulf Refining Co.
Sinclair Refining Co.
Socony-Vacuum Oil Co., Inc.
Sun Oil Company
Tide Water Associated Oil Co.

MICROMETERS & CALIPERS
Farrel-Birmingham Co.
Montague Machine Co.
Lobdell Car Wheel Co.
Walker-Goulard-Plehn Co

MIXERS
Youngstown Welding & Engrg. Co.

MOISTENING EQUIPMENT
The Spray Engineering Co.

MOTORS AND GENERATORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Co.
Ingersoll-Rand Co.
Reliance Electric & Engrg. Co.
Westinghouse Electric & Manufacturing Company

PACKING BOXES
Johnson Corporation
Shartle Brothers Machine Co.

PACKING
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
United States Rubber Co.

PAPER MACHINES
Black-Clawson Company
Downingtown Mfg. Co.
Thomas W. Hall Co.
Moore & White Co.
Pusey & Jones
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester

PAPER MACHINE SLICES
Black-Clawson Company
E. D. Jones & Sons Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.

PAPER TUBE MACHINERY
Dietz Machine Works
Thomas W. Hall Co.
Hudson Sharp Machine Company
Langston Co., Samuel M.

PASTING MACHINES
Black-Clawson Company
Davis, Frank H., Co.
Murray, D. J., Mfg. Co.
Moore & White Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John

PERFORATED METAL
Allis-Chalmers Mfg. Co.
Harrington & King Perforating Co.
Hendrick Mfg. Co.

PIPE
Black-Clawson Company
Crane Company
Grinnell Company
Shartle Brothers Machine Co.
Taylor Forge & Pipe Works
Walworth Company
Youngstown Welding & Engrg. Co.

PLATERS
The Norwood Engineering Company
Perkins & Son, Inc., B. F.

PLATES
Black-Clawson Company
Headrick Mfg. Co.
Klemp, W. F., Co.
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Timken Roller Bearing Co.

PLUGS
Black-Clawson Company
E. D. Jones & Sons Co.
The Noble & Wood Machine Co.
The Richardson Economy Plug Co.
Shartle Brothers Machine Co.

PRESSES
Black-Clawson Company
Farrel-Birmingham Co.
Dietz Machine Wks.
Thomas W. Hall Co.
Hudson-Sharp Machine Co.
Paper Converting Machine Co., Inc.
Potdevin Machine Co.
Rotogravure Engineering Co.
Shartle Brothers
Valley Iron Works Co.
Waldron Corp., John
Weber, Homer G.

PUG MILLS
Traylor Engineering & Mfg. Co.

PULPS
Anderson Co., J.
Bulkley, Dunton Pulp Co., Inc.
Gottesman & Co., Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.

PUMPS
Allis-Chalmers Mfg. Co.
Black-Clawson Company
Dorr Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Frederick Iron and Steel Co.
Ingersoll-Rand Co.
Johnson Corp.
Moore & White Co.
Nash Engineering Co.
Noble & Wood Machine Co.
Paper Converting Mch. Co.
Quimby Pump Co. Div. of H. K. Porter Company, Inc.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Warren Steam Pump Company
Worthington Pump & Machinery Corp.

RECOVERY SYSTEMS
Bulkley, Dunton Pulp Co., Inc.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Pusey & Jones
Ross Engineering Corp. J. O.
Valley Iron Works Co.

RECTANGULAR BINS
Traylor Engineering & Mfg. Co.

REELS
Black-Clawson Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Hudson Sharp Machine Company
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Rodney Hunt Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.

REFINERS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
Bauer Brothers Co.
Dilts Machine Works
The Hermann Manufacturing Co.
E. D. Jones & Sons Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sprout, Waldron & Co.
Sutherland Refiner Corp.
Valley Iron Works

REGULATORS
Allis-Chalmers Mfg. Co.
Armstrong Machine Works
Bird Machine Company
The Brown Instrument Co.
The Foxboro Company
Jones, E. D., & Sons Co.
General Electric Co.
Johnson Corp.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Shartle Brothers
Taylor Instrument Companies
Wallace & Tiernan
Westinghouse Electric & Manufacturing Company

RESINS
American Cyanamid & Chemical Corp.
The Neville Company
The Resinous Products & Chemical Co.

ROLLS
Appleton Machine Co.
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Improved Paper Machy. Corp.
Lobdell Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Perkins, B. F., & Sons Co.
Pusey & Jones Corp.
Roehlen Engraving Co.
J. J. Ross Company
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
Sinclair Co.
Smith & Winchester Mfg. Co.
Stearns Magnetic Mfg. Co.
United States Rubber Co.
Valley Iron Works Co.
Waldron Corp., John

ROLL COVERS
The Cincinnati Rubber Mfg. Co.
Youngstown Welding & Engrg. Co.

ROLL STANDS
Cameron Machine Co.
Johnstone Eng. & Machine Co.
The Kohler System Company
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.

ROTARY KILNS
Traylor Engineering & Mfg. Co.

SATURATING MACHINES
Black-Clawson Company
Moore & White Co.
Noble & Wood Machine Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman C.

SCALES
Merrick Scale Mfg. Co.

SCREEN PLATES
Fitchburg Screen Plate Co.
Morey Paper Mill Supply Co.
Union Machine Co.
Union Screen Plate Co.

SCREENS
Allis-Chalmers Mfg. Co.
Appleton Wire Works
Appleton Machine Co.
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Harrington & King Perforating Co.
Hendrick Manufacturing Co.
E. D. Jones & Sons Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
Valley Iron Works Co.

SCRUBBERS
Traylor Engineering & Mfg. Co.

SHEET MACHINES
Thomas W. Hall Co.
The Hermann Manufacturing Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
Valley Iron Works Co.

SHOWER PIPES
Bird Machine Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
Moore & White Co.
Shartle Bros. Mach. Co.
Smith & Winchester Mfg. Co.

SHREDDERS
Bauer Brothers Co.
Carthage Machine Co.

SIZING
American Cyanamid & Chemical Co.
Black-Clawson Company
The Dow Chemical Co.
du Pont, E. I., de Nemours & Co.
National Oil Products Co.
Paper Makers Chemical Department, Hercules Powder Co.
Pioneer Salt Company
Socony-Vacuum Co.
Philadelphia Quartz Co.

SLITTERS
Black-Clawson Company
Cameron Machine Co.
Carthage Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co., Inc.
Hamblet Machine Co.
Hudson Sharp Machine Company
Johnstone Eng. & Machine Co.
Langston Co., Samuel M.
Moore & White Co.
D. J. Murray Mfg. Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Simonds Worden White Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

SPRAY NOZZLES
The Spray Engineering Co.

STARCH
American Cyanamid & Chemical Corp.
Clinton Co.
National Starch Products, Inc.
Stein, Hall & Co., Inc.

WHERE TO BUY

STEAM SPECIALTIES
Johnson Corp.
Shartle Bros. Mch. Co.
Stickle Steam Specialties Co.

STRAPPING & STRAPPING MACHINES
The Stanley Works

STUFF CHESTS
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

SUCTION BOXES
Black-Clawson Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Westinghouse Electric & Manufacturing Company.

SULPHUR
American Cyanamid & Chemical Corp.
Stauffer Chemical Company
Texas Gulf Sulphur Co.
Witco Chemical Company

SULPHUR BURNERS
Valley Iron Works Co.

TALC
American Cyanamid & Chemical Corp.
W. H. Loomis Talc Corp.
International Talc Company

TANKS
Frederick Mfg. Co.
E. D. Jones & Sons Co.
Kalamazoo Tank & Silo Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
The Noble & Wood Machine Co.
H. K. Porter Company Inc.
Rodney Hunt

J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
United States Rubber Co.
Waldron Corp., John
Youngstown Welding & Engrg. Co.

THICKENERS, DECKERS & SAVEALLS
Bird Machine Company
Bulkley, Dunton Pulp Co. Inc.
Carthage Machine Co.
Dilts Machine Works
Dorr Co.
Downingtown Mfg. Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

TITANIUM
E. I. Du Pont de Nemours & Co.
Titanium Pigment Co.
R. T. Vanderbilt Co.
Witco Chemical Company

TOOLS
Acme Steel Company
Ingersoll-Rand Co.
The Stanley Works
Walworth Company

TRUCKS
Elwell Parker Electric Co.
Wright-Hibbard Ind. Elec. Truck Co.

TRAPS
Armstrong Machine Works
Crane Co.
Grinnel Company
Johnson Corporation
Shartle Bros. Mch. Co.

TUBS
Noble & Wood Machine Co.
Rodney Hunt Machine Co.
Shartle Brothers
Valley Iron Works Co.

TURBINES
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.

General Electric Company
Hunt, Rodney, Mach. Co.
Westinghouse Electric & Manufacturing Company
Worthington Pump & Machinery Corp.

USED EQUIPMENT
Frank H. Davis Company
Gibbs-Brower Co.
Thomas W. Hall Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
Shartle Brothers Machine Co.

VALVES
Crane Company
Dilts Machine Works
The Foxboro Company
E. D. Jones & Sons Co.
Kennedy Valve Mfg. Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
William Powell Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Taylor Instrument Companies
Valley Iron Works Co.
Walworth Company

VATS & VAT PARTS
Union Machine Co.
Union Screen Plate Co.

WASHERS
Bird Machine Company
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Rodney Hunt Machine Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

WAXING MACHINERY
Black-Clawson Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

WELDING EQUIPMENT
Allis-Chalmers Mfg. Co.
General Electric Company
Walworth Company
Westinghouse Electric & Manufacturing Company

WET MACHINES
Black-Clawson Co.
Carthage Machine Co.
Downingtown Mfg. Co.
Moore & White Co.
Montague Machine Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

WINDERS AND REWINDERS
Black-Clawson Company
Cameron Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co.
Hudson-Sharp Mach. Co.
Langston Co., Samuel M.
Johnstone Eng. & Machine Co.
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Potdevin Machine Co.
Pusey & Jones Corp.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Waldron Corp., John

WIRES
Appleton Wire Works
Black-Clawson Company
Bulkley, Dunton Pulp Co. Inc.
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Norton Company ..... —

Oakite Products, Inc. ..... —
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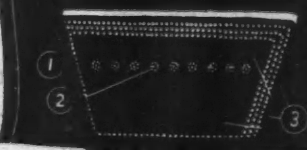

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